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The *Heteromeringia* (Diptera: Clusiidae: Clusiodinae) of Australia

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ABSTRACT. The *Heteromeringia* of Australia and Tasmania are revised, with illustrations and a key to species provided. Thirteen of the twenty Australian *Heteromeringia* are described here as new: *H. asteia* n.sp., *H. bisetosa* n.sp., *H. digitula* n.sp., *H. helina* n.sp., *H. hypobrunnea* n.sp., *H. limacens* n.sp., *H. macropa* n.sp., *H. magnicauda* n.sp., *H. montana* n.sp., *H. patula* n.sp., *H. ptenopa* n.sp., *H. stegna* n.sp. and *H. trisetosa* n.sp. *Heteromeringia pulla* D.K. McAlpine, new synonym, is treated as a junior synonym of *H. spinulosa* D.K. McAlpine. A key to the six genera of Clusiidae occurring in Australia is also provided.

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Heteromeringia Czerny (Schizophora: Clusiidae: Clusiodinae) is found in all biogeographic regions, and along with *Craspedochaeta* Czerny, is the most dominant clusiid taxon of the Old World tropical and south temperate regions. Like other clusiids (also known as "druid flies"), *Heteromeringia* has an angulate extension on the outer-distal margin of the pedicel (Fig. 1), but it is unique in having a long, coiled, double-ribbed distiphallus (Fig. 60). The genus is further characterized by an absence of all preapical tibial bristles, one pair of minute lateral scutellar bristles (not two well developed pairs), and only three (rarely two) pairs of fronto-orbital bristles, the anterior pair of which are inclinate (Fig. 2).

Lonsdale & Marshall (2007a, 2008) recently treated *Heteromeringia* in their New World and Fijian revisions, redefining the genus, erecting several species groups and discussing the biology and behaviour of several species. The Australian *Heteromeringia* was last treated by D.K. McAlpine (1960) in his landmark revision of the family. He recognized nine species, one of which he tentatively described as "species A". His "species A" is here included in *H. montana* n.sp., 12 other new species are described, *H. pulla* D.K. McAlpine n.syn. is included as a junior synonym of the morphologically variable *H. spinulosa* D.K. McAlpine, the eggs of eight species are described, and all continental Australian and Tasmanian species are keyed and illustrated. Twenty species of *Heteromeringia* are now recognized to occur in Australia, only one of which (*H. bisetosa* n.sp., also found in Papua New Guinea) is known to occur outside of Australia.

Almost all Australian *Heteromeringia* are known to occur along the eastern and southeastern coastal regions of the continent, although *H. norrisi* D.K. McAlpine is found only in Western Australia. Four species are restricted to the north: *H. stegna* n.sp. (Cape York Peninsula, Northern Territory), *H. bisetosa* n.sp. (Cape York Peninsula, Papua New Guinea), *H. hypobrunnea* n.sp. and *H. limacens* n.sp. (Cape York Peninsula). *Heteromeringia laticornis* D.K. McAlpine is the most widespread Australian species, known

from New South Wales, Queensland, South Australia, the Northern Territory and Tasmania. Aside from *H. laticornis*, the only other species currently known from Tasmania are *H. spinulosa*, *H. asteia* n.sp. and *H. trisetosa* n.sp.; only *H. spinulosa* was previously known from the island.

All Australian species for which males are known, excluding *Heteromeringia ptenopa* n.sp., belong to the *H. nitida* species group—a clade defined by a pilose disc anterior and ventral to the male anepisternal bristle (Lonsdale & Marshall, 2007a; Figs 17, 22). All species in this group also share a pubescent arista, with the exception of *H. hypoleuca* D.K. McAlpine, which has the short-plumose state retained by *H. ptenopa*. In neither of these species, however, are the hairs of the arista as long as those seen in the Neotropical *H. czernyi* group or those Oriental and Oceanian species with white distal fore tarsomeres.

Although some *Heteromeringia* are distinct and/or colourful, most are difficult to characterize due to a relative lack of structural synapomorphies and sexual dimorphism in colour and pilosity. While this is seen to a degree in New World species, the Australian, Oriental and Afrotropical taxa are much more problematic. Consequently, a number of the Australian females discussed below (*H. australiae* Malloch, *H. helina* n.sp., *H. montana* and *H. patula* n.sp. in particular) are only tentatively allied with males on the basis of a handful of colour characters, and their association should be re-evaluated later with the collection of additional material and field observations. *Heteromeringia imitans* Malloch (known only from females) is another species with uncertain boundaries that as presently defined, is highly variable in colouration, and will likely prove to be a "dumping ground" for other predominantly black taxa.

Key to the genera of Clusiidae in Australia

1 Both mid and hind tibiae with dorsal preapical bristles. Posterior fronto-orbital bristle often smaller than anterior fronto-orbitals. Anterior fronto-orbital bristle always reclinate. Phallus sac-like 2

—— Hind tibia never with dorsal preapical bristle; mid tibia usually without bristle. Posterior fronto-orbital never smaller than anterior fronto-orbitals. Anterior fronto-orbital bristle usually inclinate, sometimes reclinate. Phallus long and coiled or rod-like. 3

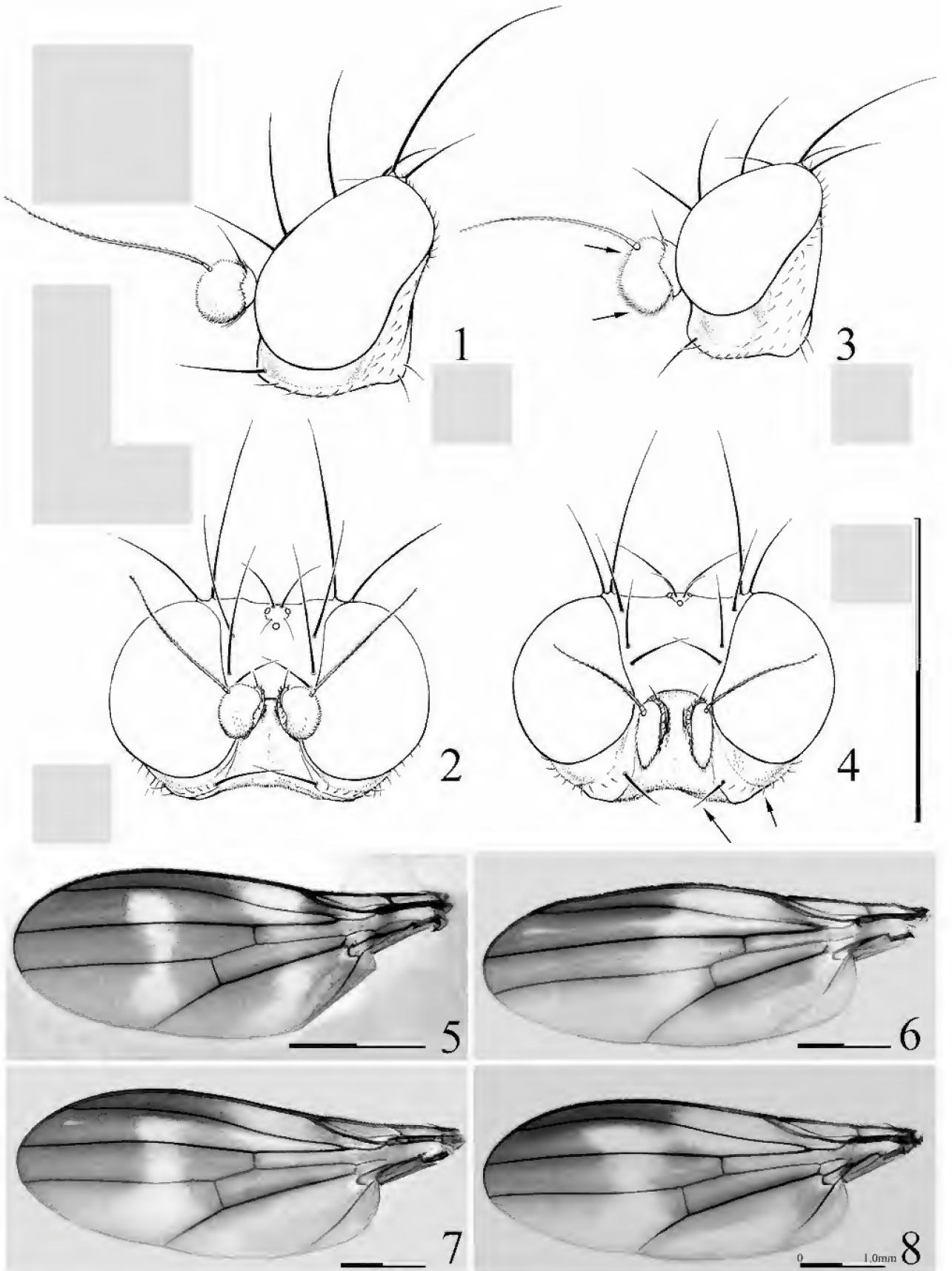
2 Four or five pairs of fronto-orbital bristles with third fronto-orbital from rear inclinate. Interfrontal bristle absent. Genal bristles small and hair-like, with hind bristle sometimes well developed. Head not wider than thorax. Ejaculatory apodeme enlarged distally so as to appear mushroom-shaped. Surstylus with few bristles on outer face. Spermatheca clear and untelescoped ..... *Craspedochaeta* Czerny

—— Two or three fronto-orbital bristles; all reclinate, with anterior and posterior bristles small to absent. Interfrontal bristle present. Several medial genal bristles more strongly developed. Head sometimes wider than thorax. Ejaculatory apodeme long and thin. Surstylus evenly setose on outer face. Spermatheca darkly pigmented and telescoped ..... *Hendelia* Czerny

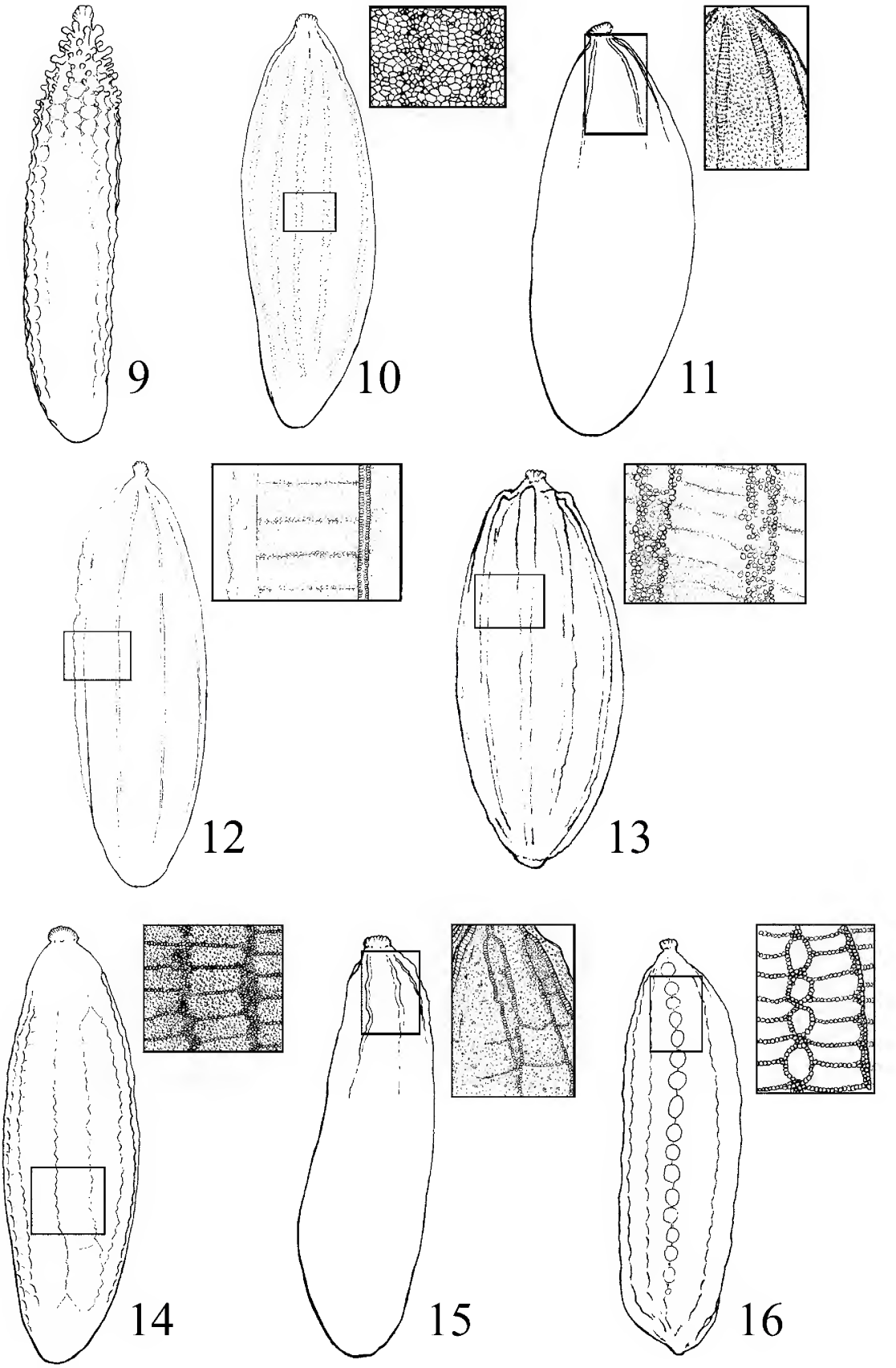
3 Anterior fronto-orbital bristle reclinate. Interfrontal bristles, if present, minute and near anterior margin of frons. Occiput often very large, triangular and silvery tomentose. Spermatheca segmented, but not telescoped ..... *Allometopon* Kertész

—— Anterior fronto-orbital bristle inclinate. Interfrontal bristles absent. Occiput usually narrow and shiny. Spermatheca various, but strongly telescoped if segmented 4

4 Triangular extension on outer margin of pedicel obtuse and blunt. Scutellum flat and dorsally wrinkled. One pair of thin lateral scutellar bristles. Distiphallus elongate, coiled, black, double-ribbed and fused to basiphallus. Pregonite large and fused to hypandrium. Phallapodeme highly reduced, thin and without ventral plate-like process. Postgonite absent. Lateral lobe of distiphallus absent. Ejaculatory apodeme comparable in length to hypandrium and with apex fan-like. Spermatheca strongly telescoped ..... *Heteromeringia* Czerny



Figures 1–8. Figs 1 and 2, head, *Heteromeringia spinulosa* McAlpine; (1) left lateral; (2) anterior. Figs 3 and 4, head, *H. hardyi* McAlpine; (3) left lateral; (4) anterior. Figs 5–7: wings; (5) *H. spinulosa*; (6) *H. hardyi* McAlpine; (7) *H. australiae* Malloch; (8) *H. australiae*, tentatively included NSW female.



Figures 9–16. Eggs. (9) *Heteromeringia trisetosa* n.sp.; (10) *H. hardyi* McAlpine; (11) *H. spinulosa* McAlpine; (12) *H. bisetosa* n.sp.; (13) *H. digitula* n.sp.; (14) *H. laticornis* McAlpine; (15) *H. australiae* Malloch; and (16) *H. hypoleuca* McAlpine.

—— Triangular extension on outer margin of pedicel acute and projecting. Scutellum smooth and slightly convex. One or two pairs of well developed lateral scutellar bristles. Phallus rod-like with components separate. Pregonite small and separate from hypandrium. Phallapodeme long, well developed and with ventral shield. Postgonite present. Lateral lobe of distiphallus usually present. Ejaculatory apodeme small with apex thin and rounded. Spermatheca untelescoped 5

5 Mid tibia without dorsal preapical bristle. Four pairs of fronto-orbital bristles (three in some *T. ustulata*). Anterior dorsocentral bristle usually close to posterior dorsocentral. Cell bm closed. Posterior margin of male sternite 6 setose. Distiphallus curled medially and without additional anterobasal sclerite. Spermatheca irregular in shape, pigmented and strongly wrinkled ..... *Tetrameringia* D.K. McAlpine

—— Mid tibia with dorsal preapical bristle. Three pairs of fronto-orbital bristles. Dorsocentral bristles widely spaced. Cell bm open. Posterior margin of male sternite 6 bare. Distiphallus straight and with small sclerite covering base. Spermatheca spherical, clear and smooth ..... *Sobarocephala* Czerny

Materials and methods

The material used in this revision was borrowed from the Australian Museum, Sydney (AMS), the Australian National Insect Collection, Canberra (ANIC), the Canadian National Collection of Insects and Arachnids, Ottawa (CNC), the University of Guelph Insect Collection (DEBU), the Deutsches Entomologisches Institut, Eberswalder (DEI), the Museum d'Histoire Naturelle, Genève (MHNG), the Queensland Museum, Brisbane (QMBA), Tel Aviv University (TAU) and the University of Queensland Insect Collection, St. Lucia (UQIC).

Specimen preparation and terminology follows that in Lonsdale & Marshall (2006, 2007a). Unless otherwise stated, body lengths and M_{1+2} ranges include those for both sexes. Labelled male genitalia are presented in Figs 58–61.

An updated key to the genera of Clusiidae in Australia is provided because of recent discoveries in the Australian fauna and a number of changes to generic classification (D.K. McAlpine, 1971; Marshall, 2000; Lonsdale & Marshall, 2007b, 2008, unpublished data). Six genera of Clusiidae are now known to occur in Australia.

Immature stages of *Heteromeringia*

Eggs. *Heteromeringia* eggs are described here for the first time, recovered directly from dissected female abdomens of *H. australiae* (Fig. 15), *H. bisetosa* (Fig. 12), *H. digitula* n.sp. (Fig. 13), *H. hardyi* D.K. McAlpine (Fig. 10), *H. hypoleuca* (Fig. 16), *H. laticornis* (Fig. 14), *H. spinulosa* (Fig. 11) and *H. trisetosa* (Fig. 9). Like the eggs of other clusiids, they are elongate oval in outline, the micropyle is small and raised and they are approximately as long as tergite 7. The surface is usually also covered with slightly raised rows of tubercles that enclose cells of smaller, scattered tubercles. These cells are generally wider than long, sometimes incomplete, and disappear near the midpoint or base of the egg.

While these are general characteristics of *Heteromeringia* eggs, there are a number of departures from this generalized state. In *H. spinulosa* and *H. australiae*, only a few strips of minute cells are present within the raised ridges near the apex of the egg, although a few indistinct cells (sometimes incomplete) are also present between these ridges in *H. australiae*. Within-ridge cells are also seen in *H. digitula*, which has complete between-ridge cells along most of the length of the egg; the ridges are also slightly more raised, particularly near the apex, where they resemble flying buttresses. In *H. bisetosa*, long, rectangular cells are only present within two rows flanking a single thin keel, which is unique to the species. The surface of the egg of *H. hypoleuca* is unusual in that it is entirely smooth excluding single or double rows of tubercles enclosing complete cells; only one row of ovate within-ridge cells is present and it is suspended from the surface of the egg. In *H. hardyi*, the tubercles are flat and the spaces between them are sharply angulate, resembling cracks in a field of dried mud; the ridges are also unusual in that they are inverted, represented by double rows of small staggered pits.

The egg of *Heteromeringia trisetosa* differs most markedly from those of all other known clusiids, and were it not removed directly from a female's abdomen, it would be suspected to belong to a species from a different family. The surface is entirely smooth and covered with a number of longitudinal scalloped ridges that nearly extend to the base of the egg. These ridges coalesce in the apical quarter of the egg to form hexagonal cells, the corners of which are produced to form increasingly larger papillae.

Puparia. Puparia of *Heteromeringia* are known only for the holotype of the Australian *H. norrisi* (D.K. McAlpine, 1960). The puparium is distinct from those of other Clusiidae in that there is a small triangular spur on the inner surface of the posterior respiratory horn (Figs 62, 63).

Key to the Australian *Heteromeringia*

1 Thorax yellow with brown stripes. Wing lightly clouded 2

—— Thorax dark brown, but, if dark with lighter stripes (*H. australiae*), wing banded (Figs 7, 8) 5

2 Scutum with single central floating stripe. Fore tibia yellow. Frons evenly orange medially. Bristles black ..... *H. limacens* n.sp.

—— Scutum with one pair of stripes that often join anteriorly and continue onto sides of scutellum. Fore tibia brown, at least laterally. Frons with black medial tint (darkest laterally). Bristles brown 3

3 Fore tarsi brown with distal two or three segments white. Anterior and posterior margins of fore tibia yellow to light brown. Pleuron yellow with thin, oblique subnotal stripe or thick black stripe touching notal margin. Tergites 1 and 2 brown. Surstylus pointed (Fig. 44) ..... *H. hypoleuca* D.K. McAlpine

—— Fore tarsi entirely brown. Fore tibia entirely dark brown. Pleuron with faint white or orange subnotal mottling. Tergites 1 and 2 yellow. Surstylus rounded to truncated (Figs 38, 41) 4

4 Notal stripes broad, connecting anteriorly and attaining anterior margin of scutum. First flagellomere with inner-basal spot. Stripes on back of head reaching foramen. Surstylus widest at base (Fig. 38) ..... *H. hypobrunnea* n.sp.

—— Notal stripes very thin, separate and not extending past transverse suture. First flagellomere entirely pale. Stripes on back of head restricted to outer margins. Surstylus widest at apex (Fig. 41) ..... *H. digitula* n.sp.

5 Hairs of arista much longer than width of central filament. Katepisternum yellow below anepisternal suture. Surstylus wrinkled (Fig. 69). Wing clear ..... *H. ptenopa* n.sp.

—— Hairs of arista approximately as long as width of central filament at base. Katepisternum entirely brown, sometimes excluding ventral margin (*H. asteia*). Surstylus smooth. Wing at least infuscated anterodistally 6

6 Vibrissae short and straight—barely overlapping if folded towards each other. Length of gena no more than twice height (Figs 3, 4). First flagellomere lobate ventrally and recessed dorsally (sometimes indistinct), with arista relatively close to pedicel. Wing with anterodistal infuscation and sometimes with cloud around dm-cu, but never banded 7

—— Vibrissae long and usually curved upwards—widely overlapping if folded inwards (relatively short in *H. norrisi*). Length of gena at least three to four times height (Figs 1, 2). First flagellomere bilaterally symmetrical dorsoventrally; arista not near pedicel. Wing variable, sometimes with pronounced spots or bands 9

7 Mid and hind femora yellow, sometimes with brownish spot on apex of hind femur, or pale brownish band medially on male mid femur. Male: frons yellowish around bases of reclinate orbital bristles; fore tibia brown; fore tarsi yellow with distal two tarsomeres brownish; epandrium not wider than pregenitalic segments and mid and hind femora yellow; sides of epandrium excavated to reveal prominent hypandrium+pregonite (Fig. 32); apex of phallus terminating in two long filaments on one side (Fig. 34). Female: fore tarsi relatively high and flat (height strongly tapering past second segment); fore femur yellow with dark inner-distal spot; tergite 8 not produced posterolaterally; sternite 8 only slightly tapering apically; spermathecae with minute medial papillae (Fig. 93) ..... *H. hardyi* D.K. McAlpine

—— Hind and (usually) mid femora with wide dark brown medial bands. Male: frons dark brown around bases of reclinate orbital bristles; fore tibia partly brown; if tarsi yellow with distal segments somewhat darker, epandrium very large and bulbous; terminalia not as above. Female (unknown for *H. magnicauda)*: fore tarsi not modified as above; fore femur dark brown on distal ½–¾; tergite 8 wrapping around segment posterolaterally and sternite 8 strongly tapered apically; spermathecae smooth excluding shallow basal wrinkles (Fig. 99) 8

8 Fore tarsi dark brown. Fore tibia yellow with inner-distal margin brownish. Epandrium much narrower than pregenitalic segments (Fig. 47). Surstylus small and rounded. Distiphallus with complex distal sclerite. Hypandrium+pregonite as in Fig. 49 ..... *H. laticornis* D.K. McAlpine

—— Fore tarsi yellow with distal segments brownish or entirely brown. Fore tibia brown, sometimes with apex lighter. Epandrium very large and bulbous (Fig. 54). Surstylus longer than wide and triangular. Distiphallus bifid apically, without apical sclerites, and with medial "wings" (Fig. 56). Hypandrium+pregonite as in Fig. 57 ..... *H. magnicauda* n.sp.

9 Two fronto-orbital bristles. Wing dark anterodistally, as well as around and between R_{4+5} and M_1 to r-m; dusky around dm-cu. Antenna sometimes entirely dark brown ..... *H. bisetosa* n.sp.

—— Three fronto-orbital bristles. Wing various, but not as above. Antenna always yellow, at least in part 10

10 Three dorsocentral bristles. Legs predominantly brown with tibiae paler (hind tibia sometimes with two dark bands) ..... *H. trisetosa* n.sp.

—— Two dorsocentral bristles, sometimes with one relatively well developed setula in front of anterior bristle. Mid and hind tibiae and femora usually entirely or predominantly yellow (*H. imitans* sometimes with dark legs) 11

11 Wing with dark, distinct, anterodistal bar along distal half of costa connecting (or nearly connecting) distal and medial bands (Figs 7, 8); additional transverse band usually present at wing base (Fig. 5) 12

—— Wing clear, dusky, or infuscated anterodistally; if cross veins surrounded by spot, then widely separated from distal spot (Fig. 6) 13

12 Body length 4.1–4.5 mm. Wing with two bands (medial band sometimes appearing to fade into dusky basal region). Male sometimes with grey or beige colouration on scutum (Fig. 22). Palpus usually brown at base or apex. Male anepisternal disc at least seven times width of anepisternal bristle. Fore tibia entirely dark brown. Hind femur brown apically. Surstylus relatively broad—length not more than three times width at midpoint (Fig. 24). Phallus relatively straight (single lateral lobe present at midpoint), smooth, and with small, thin reticulated membrane at apex. Subterminal flagellum of ventral receptacle straight ..... *H. australiae* Malloch

—— Body length 2.8–3.5 mm. Wing with three distinct bands (fourth basal band near alar base sometimes indistinct). Male scutum entirely brown excluding variable yellow posterolateral tint. Palpus entirely yellow. Male anepisternal disc not more than four to five times width of anepisternal bristle. Fore tibia dark brown (some females) or pale with apex brown (all males and some females). Hind femur entirely yellow. Surstylus relatively thin—length at least four times width at midpoint (Fig. 73, 78). Phallus strikingly branched at midpoint, covered with minute spicules from midpoint to base and without thin reticulated membrane at apex (Fig. 75); sometimes with "phallic blade" (Fig. 77). Subterminal flagellum slightly to strongly coiled (Fig. 106) ..... *H. spinulosa* D.K. McAlpine

13 Face, parafacial and gena entirely black. Wing dark with posterior margin clearer ..... *H. imitans* Malloch

—— Face, parafacial and gena yellow to orange (posterior half of gena sometimes dark brown). Wing dusky or with anterodistal infuscation; sometimes with dark spot around cross veins 14

14 Wing with dark distal band and medial cloud around cells dm and bm (Fig. 17). Notum dark brown with yellowish band extending from sides of scutellum to posterior margin of notum or anterior dorsocentral ..... *H. asteia* n.sp.

—— Wing dusky or with single anterodistal infuscation. Notum dark brown, sometimes with postpronotum and notopleuron slightly paler 15

15 Tergite 1 yellow. Fore tibia yellow with brown distolateral mottling. First flagellomere brown ventrally (excluding inner base). Hypandrium+pregonite extending laterally as long, dark bars (Fig. 67) ..... *H. patula* n.sp.

—— Tergite 1 dark brown. Fore tibia entirely dark brown, or yellow with one pair of distal spots. First flagellomere entirely yellow or with pigment on dorsal or anterior half. Hypandrium+pregonite neither dark nor produced laterally. Males only past this point 16

16 Fore femur dark brown with base and apex lighter. Fore coxa brown at base ..... *H. norrisi* D.K. McAlpine

—— Fore femur only brown apically, sometimes only on inner face. Fore coxa entirely light yellow 17

17 Fore tibia yellow with one pair of distal spots (sometimes united as a band). First flagellomere entirely light yellow in male. Hypandrium+pregonite unbroken and apex of phallus with coiled filament (Fig. 37) ..... *H. helina* n.sp.

—— Fore tibia brown. First flagellomere dark, at least along anterior and inner-distal margins. Hypandrium+pregonite (seen laterally) broken into two or three sclerites divided by thin suture(s) and phallus uncoiled 18

18 Basal ⅔ of palpus brown. Frons sometimes entirely smooth and black. Epandrium nearly closed apically and surstyli almost vestigial (Figs 81, 82) ..... *H. stegna* n.sp.

—— Palpus entirely black or light yellow. Frons tomentose on anterior half, and orange to yellow anteriorly and laterally. Sides of epandrium parallel apically and surstyli well developed 19

19 Palpus entirely black. Wing dusky (clearer to base). Sides of surstylus parallel on basal half (Fig. 50) ..... *H. macropa* n.sp.

—— Palpus entirely light yellow. Wing with anterodistal infuscation. Surstylus gradually tapering to a point (Fig. 58) ..... *H. montana* n.sp.

Species descriptions (alphabetical order)

Heteromeringia asteia n.sp.

Figs 17–21, 88

Type material. HOLOTYPE: **Tasmania**: Hellyer Gorge, 41°16'24"S 145°36'55"E, on horizontal log, 20.xii.2003, S.A. Marshall (1♂, AMS). PARATYPES: **Australian Capital Territory**. 35.22S 148.50E, Blundells Ck., D.H. Colless, i.1988 (2♂♂, ANIC; 2♂♂ USNM), ii.1987 (1♀, ANIC). **New South Wales**: Coombadjah Ck., Washpool S.F., 10.i.1982, B.J. Day (1♂, AMS), Carrai SF, 30°58'48"S 152°17'06"E, 975 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. viminalis*, CS-RO-127-1 (1♀, AMS), Carrai SF, 30°59'45"S 152°16'23"E, 930 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CS-FZ-127-6 (1♀, DEBU), Werrikimbe NP, 31°11'56"S 152°10'23"E, 1025 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. campanulata*, WC-WN-127-1 (1♀, AMS). **Queensland**: N QLD, Birthday Crk. near Paluma, 18.i.1967, D.K. McAlpine & G. Holloway (1♀, AMS). **Tasmania**: Hellyer Gorge, 41°16'24"S 145°36'55"E, on horizontal log, 20.xii.2003, S.A. Marshall (1♂, DEBU), 42.44S 146.25E, 4km SW by W, T. Shea, 460 m, 3.ii.1980, Lawrence & Weir (1♀, ANIC), 42.13S 146.01E, Franklin R., 22.i.1983, I.D. Naumann & J.C. Cardale, ex. ethanol (1♀, ANIC).

Description

Male (Fig. 17). Body length 3.3–5.0 mm. Anepisternal disc present and relatively large, multiple times width of base of anepisternal bristle. First flagellomere orbicular. Bristles black. Arista closely pubescent. Vibrissa relatively long and curved. Ocellar bristle thin and short, but distinctly longer than ocellar tubercle. Two dorsocentral bristles. Gena shallow and not strongly angled or bent. Face and buccal cavity pilose and meeting at an angle. Posterior ½–⅔ of frons dark brown (lateral and posterior margins paler) and anterior ⅔ tomentose; back of head, occiput (sometimes only posterior margin) and posteroventral corner of gena dark brown; antenna (excluding arista) light yellow (Tasmanian specimens with brown infuscation bordering base of arista on inner face); face with dark yellow to orange tint; clypeus dark brown; remainder of head yellow; upper ⅔ of gena pilose. Thorax dark brown with postpronotum dark piceous, notopleuron slightly lighter brown, lateral margins of scutellum and posterolateral corner of scutum light yellow and ventral margin of katepisternum yellow; scutum sometimes with thin yellowish stripes extending from lateral half of anatergite to side of scutellum and anterior dorsocentral. Legs yellow with fore tarsi, fore tibia and inner-distal spot on fore femur dark brown; Tasmanian specimens with mid tibia light brown sub-basally, hind tibia dark brown sub-basally and hind femur with light apical infuscation on outer face. Abdomen dark brown. M_{1+2} ratio 5.5–8.0. Wing dark on distal ⅓ (fading posteriorly) and with cloud around cells br and dm (infuscation sometimes restricted to region immediately around veins). Halter white with base and side of stalk infuscated.

Female. As described for male except as follows: scutum and pleuron entirely dark brown (scutellum and anatergite still with yellowish spot); first flagellomere with anterior margin and dorsal ⅔ of inner face (or entire inner face) brown; face orange; ventral margin or medial longitudinal stripe on gena brownish; frons black with anterior margin and posterolateral corner orange; anterior half of frons tomentose. NSW females smallest of material examined, with distal ¼ of fore femur and base of hind tibia dark brown. ACT and Tasmanian females sometimes with palpus, first flagellomere, face and ventral half of gena darker.

Male terminalia (Figs 18–21). Epandrium as long as high and wider than long. Surstylus small and rounded with several inner-distal tubercle-like bristles. Length of cerci half width of epandrium, widest medially and emarginate. Hypandrium subtriangular, with bristles along basal and posterior margins; with one small anterior lobe bearing two stout bristles. Distiphallus twisted medially with fan-shaped frill and two distal/medial U-shaped sclerites.

Female terminalia (Fig. 88). Spermatheca dark with apex barely invaginated; width approximately ⅔ length. Spermathecal duct not longer than twice length of spermatheca. Ventral receptacle small with loosely coiled and relatively short flagellum.

Etymology. The specific name is derived from a Greek word for "pretty" (*asteios*).

Comments. This attractive and widespread species is characterized by a large body size, yellowish notal patches and a distinct wing pattern. It is similar to *Heteromeringia australiae* in having a large male anepisternal disc, minute ocellar bristles and a strong medial wing spot, but the latter has confluent spots on the wing, (sometimes) pale patterning on the notum and femora, distinct male genitalia and shorter spermathecae.

Heteromeringia australiae Malloch, 1926

Figs 7, 8, 15, 22–27, 89–91

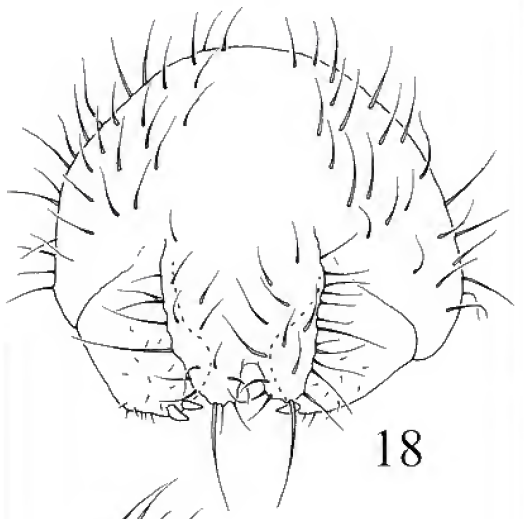
Heteromeringia australiae Malloch, 1926: 48. Frey, 1960: 25. D.K. McAlpine, 1960: 73. Sasakawa, 1966: 79.

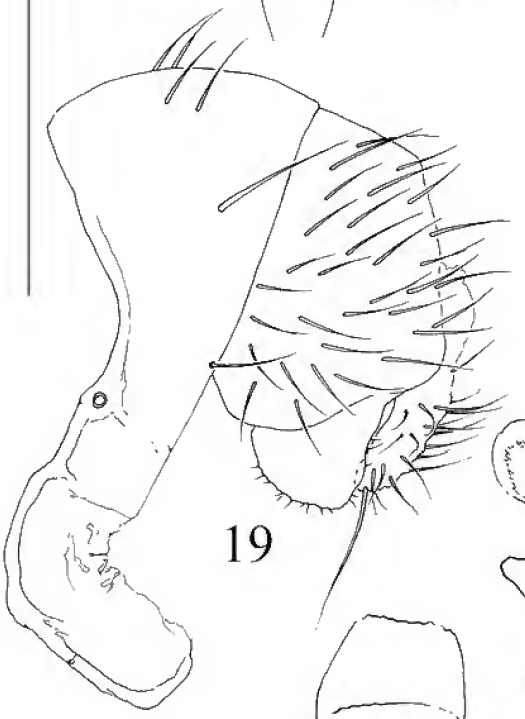
Type material. HOLOTYPE: **New South Wales**: North Coast, Coramba (1♂, AMS). [not examined].

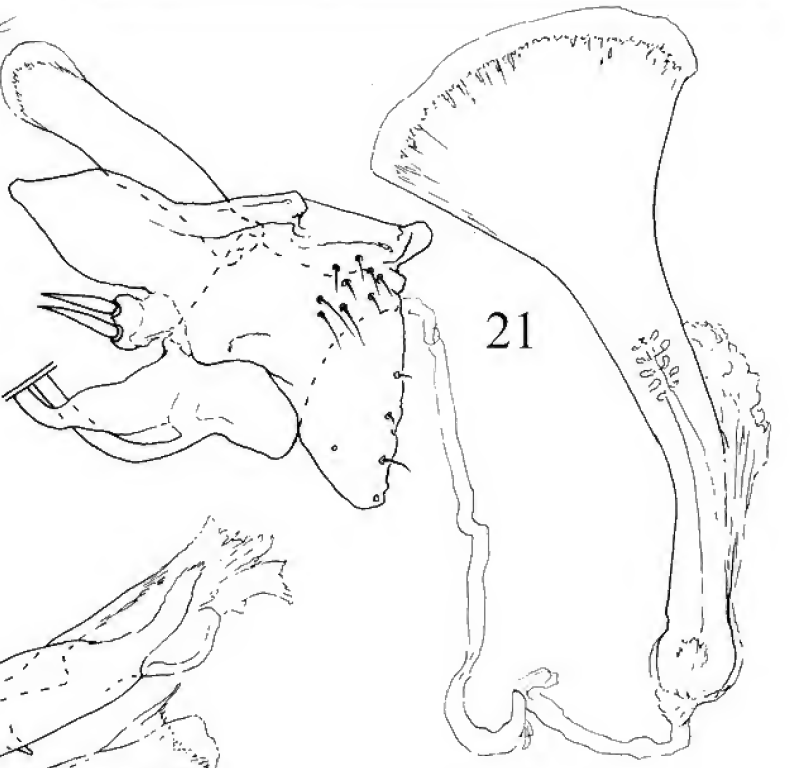
Material examined. **Australian Capital Territory**: Black Mtn., xii.1987, M. Irwin, Malaise trap (1♀, DEBU). **New South Wales**: Terania Ck. Near Lismore, D.K. McAlpine & K.C. Khoo, 5.ii.1983 (1♂, AMS; 1♂ USNM), 6.ii.1983 (2♂♂, AMS), 4 mls SW of Jervis Bay, "8.10.1949", K.H.L. Key (1♀, ANIC). **Queensland**: N QLD, The Crater, near Herberton, D.K. McAlpine & G.A. Holloway, 29.i.1972 (1♂, USNM), 30.i.1972 (1♀, AMS), Mt. Haig 2km NE by E of Atherton, 18.xi.1981, D.H. Colless, Malaise trap (1♂, ANIC), 17.27S 145.29E, Hugh Nelson Range, 1.viii–1.ix.1995, L. Umback, 1150 m, Malaise trap (1♂, DEBU), 17.06S 145.37E, GS2, Mt. Edith, 31.v–30.vii.1995, P. Zborowski, Malaise trap (1♂, ANIC), Birthday Ck. Falls via Paluma, 11–12.v.1980, I.D. Nauann & J.C. Cardale (1♀, ANIC), Danbulla For. Res., 13km NE by N of Yungaburra, 17.xi.1981, D.H. Colless, Malaise trap (1♀, ANIC). **Tasmania**: 41.50S 146.03E, Pelion Hut, 3km S Mt. Oakleigh, 860 m, 8.i–12.ii.1991, A. Calder, W. Dressler, malaise #5, closed forest (1♂, ANIC).

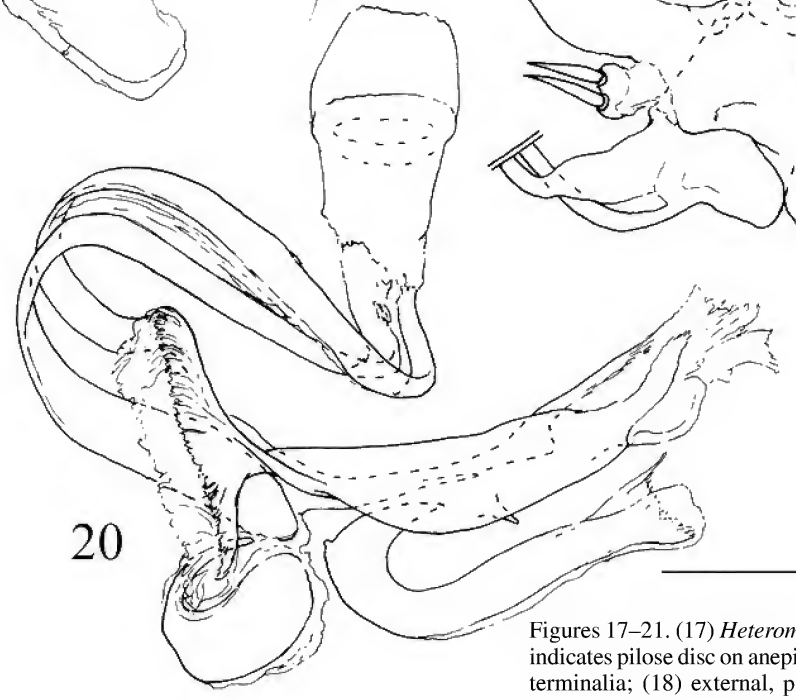
Redescription

Male (Figs 7, 22). Body length 4.1–4.5 mm. Anepisternal disc present and very large (approximately 2–3 times wider than that of other species). First flagellomere orbicular. Bristles black. Arista pubescent. Vibrissa relatively long and curved. Ocellar bristle thin and half length of postvertical. Genal bristles relatively long. Two dorsocentral bristles. Gena high and sometimes angled at midpoint. Face and buccal cavity evenly curving and velvety. Frons dark brown with lateral margin yellow and posterior margin (enclosing brown ocellar tubercle) reddish; first flagellomere with distal ⅔ of inner face (sometimes faded dorsally) and distal ⅓–½ of outer face (sometimes variably faded) infuscated; back









Figures 17–21. (17) *Heteromeringia asteia* n.sp., left dorsolateral photo; arrow indicates pilose disc on anepisternum. Figs 18–21: *Heteromeringia asteia*, male terminalia; (18) external, posterior; (19) external, left lateral; (20) phallus, anterior; (21) hypandrial complex (distal portion of distiphallus removed) with ejaculatory apodeme, left lateral. Scale bar = 0.25 mm.

of head dark brown above foramen; dorsal half of gena light yellow and silvery tomentose and ventral half of gena dark brown to orange/dark yellow; palpus light brown (paler to base); anterior margin of occiput light yellow or entirely pale; face and buccal cavity reddish; anterior half of frons pilose. Scutum grey-yellow (orange to sides) with anterior margin (including anterior half of postpronotum, which is otherwise rusty) brown and with central stripe continuing onto yellow scutellum; also with one pair of lateral floating brownish stripes. Laterotergites dark brown. Pleuron dark brown with posterior half of meron yellow. Fore legs with entirely dark brown; anterior half of mid coxa dark brown; base of mid femur light brown or basal half brown; hind femur brown apically and (sometimes) medially; hind tibia dark brown on basal ¼, lightest subapically; remainder of legs yellow. Fore tarsi slightly compressed laterally. Abdomen dark brown. M_{1+2} ratio 3.7–4.0. Wing dark with clear subapical band open to posterior margin of wing and with anterobasal margin lighter. Halter white with base and side of stalk infuscated.

Female. As described for male except as follows: thorax dark brown with postpronotum reddish and scutum with one pair of thin yellowish stripes continuing onto sides of scutellum; legs yellow with fore tibia and tarsi dark brown and fore femur with large inner-distal spot and small outer-distal spot; first flagellomere only infuscated along anterior margin; gena and parafacial yellowish-orange; apical margin of palpus very weakly infuscated; occiput yellow; terminalia yellow.

Male terminalia (Figs 24, 26, 27). Epandrium relatively small. Cerci large and united, widest medially and emarginate apically. Surstylus thin and pointed, sparsely setulose on outer face and with several inner-distal tubercle-like bristles. Hypandrium+pregonite with two subequal distal lobes (anterior lobe setulose on inner and outer faces, and posterior lobe with apical bristle behind long shallow carina). Ribs of distiphallus of nearly equal length, with one terminating in reticulated leaf-like structure; both ribs with recurved medial processes.

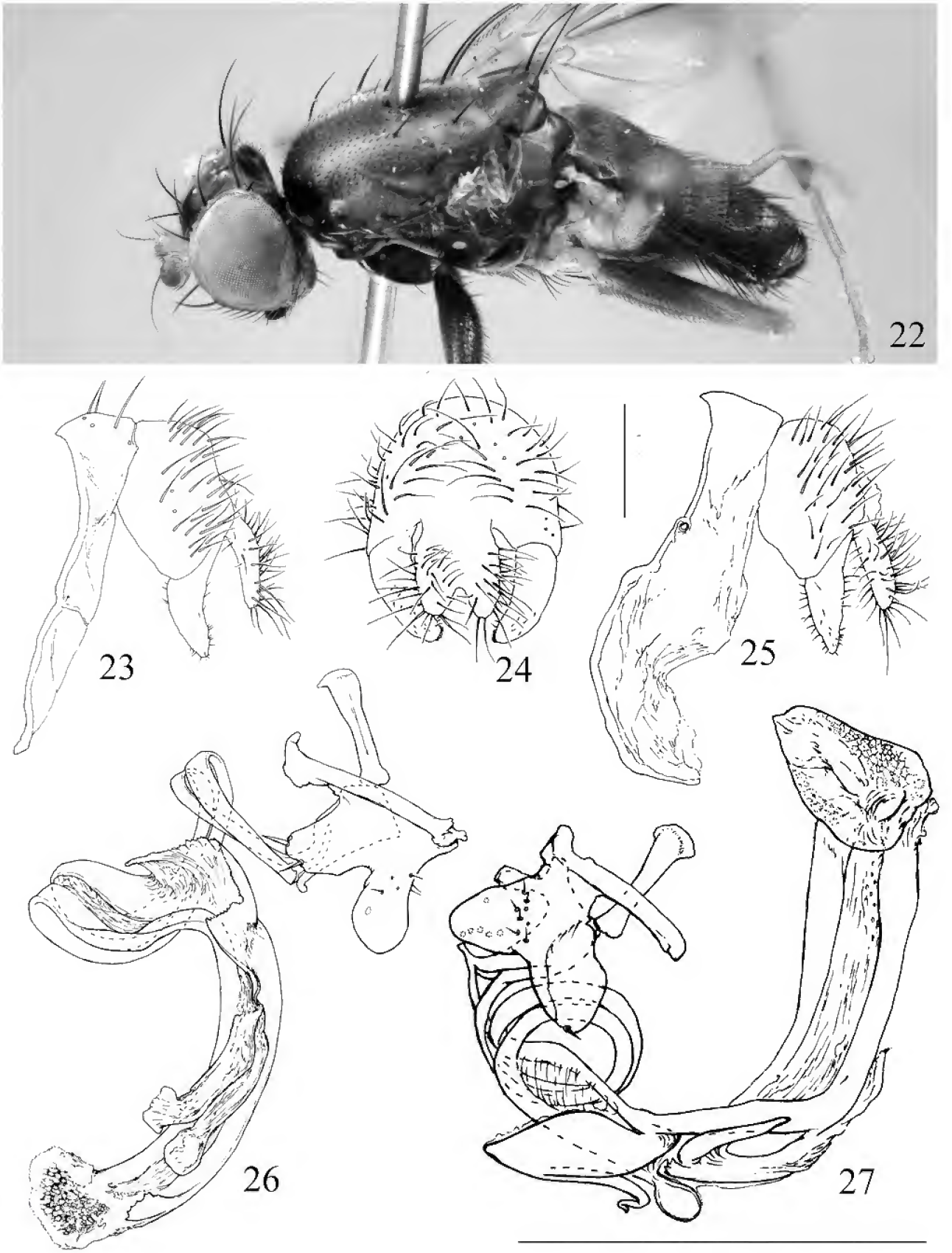
Female terminalia (Fig. 89). Ventral receptacle short and rounded with flagellum apical, very long and straight. Spermatheca smooth, as long as wide (at base), slightly tapering apically and with several basal wrinkles.

Comments. Aside from the females described above, there are several others belonging to what are possibly one or two undescribed species. They differ in that the face meets the buccal cavity at an angle, the halter is light brown, the palpus is dark brown either apically (NSW—genitalia Fig. 90) or basally (QLD—genitalia Fig. 91), the wing infuscation extends to surround A_1+CuA_2 basally (Fig. 8), the notum is almost or completely dark brown and the internal genitalia differ slightly in morphology, although this latter difference may be negligible. One of these females may be the counterpart to the smaller male outlined below, but it will not be described as distinct until more material is available. [Label data: NSW: Bruxner Park FR, N Coffs Hbr., 30°15'S 153°06'E, 200 m, yellow pans on trib. Bucca Bucca Ck., 16.x.1999, D. Bickel (1♀♀, AMS), Werrikimbe NP, 31°11'56"S 152°10'23"E, 1025 m, E. Tasker, 29.i–4.ii.1998, sticky trap on *E. camaronii*, WC-WN-018-2 (1♀, AMS). QLD: E of Mt. Edith, 800 m, r'for ck, Malaise, B. Sinclair, 22–27.iv.1994, 17.05S 145.38E (1♀, AMS), N QLD, Mt. Edith Forest Road, 1.5 mi off Danbulla Road, 6.v.1967, D.H. Colless (3♀♀, ANIC), Danbulla For. Res. 13km NE by N of Yungaburra, 17.xi.1981, Malaise trap, D.H. Colless (1♀, ANIC)].

In addition to the more widespread "typical" male described above, there is a smaller male with slightly different colouration and genitalia (Figs 23, 26) that may represent a distinct species. Label data: N QLD, The Crater, near Herberton, 29.i.1972, D.K. McAlpine & G.A. Holloway (1♂, AMS). This male can be diagnosed using the following couplet:

1 Body length 4.1–4.5 mm. Scutum dark brown with pale shoulders, or orange to grey-yellow in ground colour with dark medial and sublateral stripes. Fore coxa and femur entirely dark brown. Mid coxa dark brown on anterior half. Basal ¼–½ of mid femur light brown to dark brown. Hind tibia dark brown at base and brownish subapically. Gena yellow with venter dark brown. Surstylus straight. Medial lobe on phallus broadly rounded and with recurved process; without bilobed anterior process ..... typical male

—— Body length 3.4 mm. Scutum dark brown with shoulders reddish. Fore coxa and femur yellow with dark inner-distal spot on femur. Mid coxa, mid femur and hind tibia entirely yellow. Gena yellow. Surstylus with posterior curve. Medial lobe on phallus short and serrate; anteriorly with bilobed process ..... smaller male



Figures 22–27. *Heteromeringia australiae* Malloch. (22) left dorsolateral photo. Figs 23–27: male terminalia; (23) external, left lateral (atypical male); (24) external, left lateral (typical male); (25) external, posterior (typical male); (26) hypandrial complex, left lateral (atypical male); (27) hypandrial complex, left lateral (typical male). Scale bar = 0.25 mm.

Heteromeringia bisetosa n.sp.

Figs 12, 28–31, 92

Type material. HOLOTYPE **Australia**, Queensland: 15.30S 145.16E, 1km SE of Mt. Cook, 14.x.1980, D.H. Colless, Malaise trap (1♂, ANIC). PARATYPES **Australia**, Queensland: 12.43S 143.17E, 9km ENE of Mt. Tozer, 5–10.vii.1986, D.H. Colless (1♀, ANIC), 12.44S 143.14E, 3km ENE Mt. Tozer, 28.vi–4.vii.1986, D.M. Colless (1♂, DEBU). **Papua New Guinea**, Nadzab, Markham, R. val., N Guinea, 12.vii.1944, K.V. Krombein, E. forkNgafir, cr. 1000–2000ft., native trail, ex. colln K.V. Krombein (1♀, USNM).

Description

Male. Body length 5.5 mm. Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista pubescent. Vibrissa relatively long and curved. Mid fronto-orbital absent. Ocellar bristle minute. Two dorsocentral bristles with small bristle in front of anterior dorsocentral. Gena shallow and not sharply angled. Face and buccal cavity pilose and meeting at an angle. Head dark brown with apex of palpus and antenna (excluding arista) yellow, with anterior margin of first flagellomere infuscated; gena with thin dorsal tomentose strip; frons shiny. Thorax dark brown. Legs yellow with base of fore coxa brown, fore tarsi and tibia dark brown, apex of fore femur brown, apex of hind femur brownish and base of hind tibia brown. Fore tarsi strongly compressed laterally. Abdomen dark brown. Wing dark along anterodistal margin and between R_{4+5} and M_1 to level of dm-cu; lightly clouded around CuA_1. M_{1+2} ratio 6.0. Halter white with base and side of stalk infuscated. Paratype male differs as follows: face, parafacial and upper half of gena dark yellow; fore coxa entirely light yellow; fore femur yellow with faint inner-distal spot; hind legs entirely yellow; wing dusky, except along posterior and anterobasal margins. Halter brown.

Female. As described for Australian male except antenna entirely dark brown and pigment on hind leg slightly darker.

Male terminalia (Figs 28–31). Epandrium as wide as high and length ⅔ height. Cerci entirely fused, large and ovate. Surstylus length approximately half height of epandrium, thin, pointed and relatively anterior in position; several tubercle-like bristles on inner face apically. Phallapodeme nearly as long as hypandrium. Hypandrium + pregonite with several distal and basal setulae, and with triangular anterior and lobate basal lobes. Ribs of phallus nearly equal in length, both becoming wider and convoluted apically; one rib S-shaped apically and with medial projection produced into two overlapping triangular points.

Female terminalia (Fig. 92). Spermathecae spherical, not strongly sclerotized and without apical invagination. Remainder of internal terminalia not visible.

Etymology. The specific name refers to the presence of only two fronto-orbital bristles in this species.

Comments. The presence of only two pairs of fronto-orbital bristles is diagnostic of this species, as is the pattern on the wing, the ovate male cerci and the crossing spines on the phallus. *Heteromeringia bisetosa* is the only Australian species of that genus known to extend outside of Tasmania and continental Australia.

Heteromeringia digitula n.sp.

Figs 13, 41–43

Type material. HOLOTYPE **Queensland**: 12.44S 143.14E, 3km ENE Mt. Tozer, 28.vi–4.vii.1986, D.H. Colless (1♂, ANIC). PARATYPES **Queensland**: 12.44S 143.14E, 3km ENE Mt. Tozer, 28.vi–4.vii.1986, D.H. Colless (1♀, ANIC), Malaise trap, ethanol (1♀, DEBU).

Description

Male. Body length 3.3–4.3 mm. Anepisternal disc present. First flagellomere orbicular. Bristles brown. Arista pubescent. Vibrissa relatively long and curved. Ocellar bristle minute. Two dorsocentral bristles. Gena shallow and not sharply angled. Head yellow with first flagellomere infuscated on distal half of inner face, ocellar tubercle brown, gena with small medial rusty spot, anterior half of occiput and upper half of gena light yellow and silvery tomentose, upper-posterior half of occiput dark brown, back of head with one pair of dorsolateral spots and base of palpus whitish; frons tomentose. Thorax yellow with two very thin postsutural stripes (along dorsocentral rows, continuing onto scutellum), faint posterolateral spots, orange tint in posterolateral corner of scutum, thin sub-scutellar stripe on laterotergites and orange mottling on pleuron. Legs yellow with fore tibia and tarsi dark brown (knee yellow), coxae light yellow to white, and fore femur with oblique dark brown inner-distal spot. Fore tarsi strongly compressed laterally. Abdomen dark brown with segments 1 and 2 yellow. Wing dusky along anterodistal margin at R_{2+3} and R_{4+5}. Halter white.

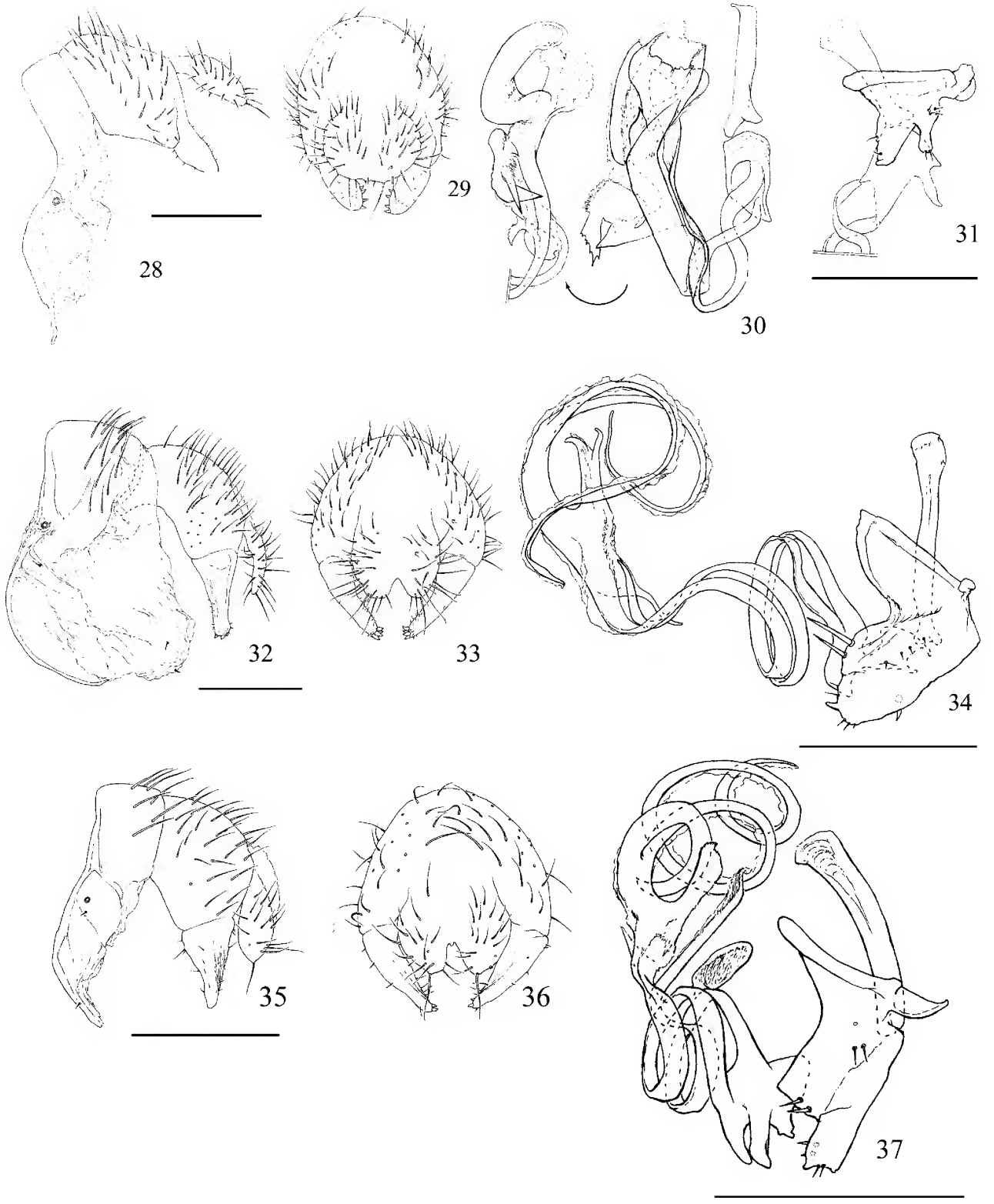
Female. As described for male except as follows: first flagellomere entirely yellow; spots on back of head only present near margins; tergites 1–4 yellow with dark medial stripe and tergite 4 also with posterolateral spot; tergite 8 (infuscated anterodorsally) and terminalia yellow; wing clear around R_{4+5} and lightly clouded around M_1 past r-m.

Male terminalia (Figs 41–43). Epandrium width nearly twice length and height. Sides of cerci nearly parallel; with deep medial emargination. Surstylus subquadrate with length and height approximately ⅔ that of epandrium; inner-distal margin lined with tubercle-like bristles. Phallapodeme nearly as long as hypandrium. Hypandrium+pregonite divided into thin anterior lobe with one stout bristle and wider posterior lobe with numerous setulae. Basiphallus with thin posterobasal lobe. Ribs of phallus nearly equal in length with one rib bifid apically and one rib pointed and sharply recurved medially.

Female terminalia. Similar to those of *limacens* (Fig. 100).

Etymology. The specific name refers to the recurved finger-like process on the phallus.

Comments. See comments for *Heteromeringia hypoleuca*.



Figures 28–37. Figs 28–31: male terminalia, *Heteromeringia bisetosa* n.sp. (Mt. Cook male); (28) external, left lateral; (29) external, posterior; (30) phallus, anterior (left detail distiphallus of Mt. Tozer male); (31) hypandrial complex (distal portion of distiphallus removed), left lateral. Figs 32–34: male terminalia, *Heteromeringia hardyi* McAlpine; (32) external, left lateral; (33) external, posterior; (34) hypandrial complex, left lateral. Figs 35–37: male terminalia, *Heteromeringia helina* n.sp.; (35) external, left lateral; (36) external, posterior; (37) hypandrial complex, left lateral. Scale bar = 0.25 mm.

Heteromeringia hardyi D.K. McAlpine, 1960

Figs 1, 2, 6, 10, 32–34, 93

Heteromeringia hardyi D.K. McAlpine, 1960: 75.

Type material. HOLOTYPE: **New South Wales**: Blue Mountains, Katoomba, 19.xii.1956, G.H. Hardy (1♂, AMS). PARATYPES: **New South Wales**: Same collection as holotype (1♀, AMS), 6.xii.1956 (1♂, AMS), 29.xii.1956 (1♂, AMS), 23.xi.1956 (1♀, AMS), 17.xii.1956 (1♀, AMS).

Additional material examined. **New South Wales**: Katoomba, 24.i.1961, G.H. Hardy (1♂, AMS), Tahmoor, 7.x.1978, B.J. Day (1♀, AMS), 20.ix.1981, D.K. McAlpine & B.J. Day (1♀, AMS), Mt. Banks, Blue Mountains, 1.i.1982, D.K. McAlpine (1♀, AMS), 8km S Mt. Wilson, Blue Mts., 27.ix.1989, D.K. McAlpine (3♀♀, AMS), 3km E Wedderburn, 34°08'S 150°49'E, 28.x.2003, at MV light, D. Britton (1♀, AMS), Mooney Mooney Ck. Near Gosford, 17.xii.1981, B. Day (1♂, AMS), Werrikimbe NP, 31°11'24"S 152°09'39"E, 1030 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. viminalis*, WC-WT-127-6 (1♀, AMS), Werrikimbe NP, 31°11'56"S 152°10'23"E, 1025 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. cameronii*, WC-WN-127-3 (1♀, USNM), Carrai SF, 30°59'45"S 152°16'23"E, 930 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CS-FZ-127-6 (1♂, AMS), Carrai SF, 30°54'35"S 152°16'26"E, 1090 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-FK-127-4 (1♂, AMS), Carrai SF, 30°54'35"S 152°16'26"E, 1090 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CC-FK-018-2 (1♂, AMS), Carrai SF, 30°54'33"S 152°16'28"E, 1075 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-CR-127-2 (1♂, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-DP-127-4 (1♂ 1♀, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. obliqua*, CC-DP-127-1 (1♂ 1♀, USNM), Carrai SF, 30°54'33"S 152°16'28"E, 1075 m, E. Tasker 11–16.i.1998, sticky trap on *E. cameronii*, CS-FZ-127-4 (1♀, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. cameronii*, CC-DP-127-6 (1♂ 1♀, USNM), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CC-DP-128-4 (1♀, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CC-DP-018-4 (1♂, DEBU). **Queensland**: Mt. Glorious, 27°19'54"S 152°45'29"E, Malaise, T. Hiller, 24–30.xi.1997 (1♀, DEBU), 3–9.i.1998 (1♀, DEBU), Mt. Glorious, 1.ix–17.x.1990, A. Hiller, Malaise (1♀, ANIC), N QLD, 2 mi W Paluma, 3000', 16.i.1970, MV lamp, G.A. Holloway (1♀, AMS).

Redescription

Male (Figs 1, 2, 6). Body length 3.0–4.5 mm. Anepisternal disc present. First flagellomere recessed dorsally and lobate ventrally. Bristles dark brown. Arista pubescent. Vibrissa short and straight. Ocellar bristle relatively stout and longer than tubercle. Two dorsocentral bristles. Gena high and sharply incurved medially at mid-height. Face and buccal cavity evenly curved and velvety. Frons brown on posterior ⅔ (lateral and posterior margins paler); back of head dark brown; occiput and posteroventral corner of gena dark brown; face lighter dorsally; gena silvery tomentose above genal bristles; anterior ⅔ of frons pilose. Thorax dark brown. Legs yellow except as follows: mid coxa brown dorsally; hind coxa light brown; fore femur with large, dark anterodistal and posterodorsal spots (usually somewhat confluent); fore tarsi brownish on distal two or three segments; hind femur somewhat dusky on outer surface apically; hind tibia brown on basal ⅓; mid and hind femora sometimes brownish dorsomedially; mid femur and mid and hind tibiae sometimes with wide central band; fore coxa sometimes with minute brownish spot on dorsal margin, and gena and venter of face dusky. Fore tarsi cylindrical in cross section. Abdomen dark brown. M_{1+2} ratio 6.5–7.3. Wing clouded on distal half of anterior margin; veins, excluding costa and R_{2+3}, surrounded by light infuscation. Halter white with base and side of stalk infuscated.

Female. As described for male except as follows: fore tarsi dark brown, high and laterally flattened (height sharply decreasing past second segment); fore femur with outer-distal spot absent or fused to inner spot; fore tarsi dark brown; mid coxa brown on outer-dorsal half; fore tibia sometimes white with base dark brown; mid tibia sometimes mottled medially; apex of mid and hind femora and base of mid tibia variably infuscated; base of hind tibia brown; frons pilose anteromedially; first flagellomere dark along anterior and dorsal margins, or entirely dark excluding basal margin; gena and venter of face dusky; tergites 2–5 sometimes yellow on anterior ⅔, or with anterior half of tergite 2 and all of tergites 3–5 yellow; wing without light infuscation around veins. Two non-type females with fore tarsi only slightly modified, fore tibia entirely light yellow, apex of fore femur brown, hind knee brown and face and gena entirely reddish-brown.

Male terminalia (Figs 32–34). Epandrium deeply excavated on anterior margin, continuous with posterior margin of large hypandrium+pregonite. Cerci widest subapically and emarginate. Surstylus long and thin (narrowest subapically) with few anterodistal setulae and several inner-distal tubercles. Hypandrium+pregonite with single large basal lobe with anterodistal and medial setulae, two stout medial bristles and stout posterodistal bristle on inner face. Distiphallus with one rib short, thin and tapered, and one rib large and elaborate apically: with thin posteriorly-directed process, one wider anteriorly-directed process and elongate bifid distal process.

Female terminalia (Fig. 93). Spermatheca with several shallow basal wrinkles and many minute medial tubercles; apex broadly rounded with apical invagination small and offset. Ventral receptacle and flagellum not visible.

Heteromeringia helina n.sp.

Figs 35–37, 94

Type material. HOLOTYPE: **New South Wales**: Carrai SF, 30°54'33"S 152°16'28"E, 1075 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-CR-127-2 (1♂, AMS). PARATYPES: **New South Wales**: Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-DP-127-4 (2♂♂, AMS), Werrikimbe NP, 31°11'56"S 152°10'23"E, 1025 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. viminalis*, WC-WN-127-5 (1♂, DEBU), Werrikimbe NP, 31°11'56"S 152°10'23"E, 1025 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. campanulata*, WC-WN-127-1 (♂, AMS; 1♂, USNM), sticky trap on *E. saligna*, WC-WN-127-6 (1♂, AMS).

Additional material examined. **New South Wales**: Leura Falls, 3.i.1973, D.H. Colless (2♀♀, ANIC).

Description

Male. Body length 2.9–3.4 mm. Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista pubescent. Vibrissa relatively long and curved. Ocellar bristle long and as thick as postvertical. Two dorsocentral bristles. Gena relatively small and angled inwards, but not bent at mid-height. Face and buccal cavity smoothly curving and velvety. Frons brownish-orange with anterior, lateral and posterior margins yellowish; first flagellomere light yellow;

face rusty; back of head dark brown above foramen; anterior ⅓–½ of gena sometimes rusty; upper half of gena silvery tomentose; anterior half of frons pilose. Thorax dark brown with orange tint on posterior half of postpronotum. Legs yellow with fore coxa light yellow, fore tarsi brown with basal one or two segments light brown to yellow, fore femur brown apically on sides, and fore tibia with dark inner and outer subapical spots (sometimes also with light outer sub-basal spot); apical spots on fore femur and tibia sometimes form complete bands. Fore tarsi ovate in cross section. Abdomen dark brown. M_{1+2} ratio 6.0–8.5. Wing dusky along anterodistal margin. Halter white.

Female. As described for male except as follows: notum evenly brown; fore tarsi laterally flattened; fore tibia darker with faint brown mottling; first flagellomere yellow with anterior and inner-distal margins infuscated on dorsal half; dorsal half of occiput brown; gena yellow.

Male terminalia (Figs 35–37). Epandrium well developed and relatively large (comparable to those of *Sobarocephala* species, but much smaller than that of *H. magnicauda*). Cerci widest medially and emarginate. Surstylus dark, heavily-sclerotized, triangular, with longitudinal wrinkles and two apical tubercle-like bristles. Hypandrium+pregonite long, thin and truncated with square anterodistal emargination. Distiphallus with two posterobasal projections at junction with basiphallus; with lobate posteriorly-directed sclerite projecting from one rib near base; other rib trifid with one process long and coiled.

Female terminalia (Fig. 94). Sternite and tergite 8 entirely fused. Spermathecae wider than long, transversely wrinkled, apically concave and with distal margin raised on one side. Ventral receptacle slightly tapered apically and with subterminal flagellum straight and long.

Etymology. The specific name is derived from the Greek for "vine tendril" (*helinos*), describing the shape of the phallus.

Comments. Like many Australian congeners, *Heteromeringia helina* has a dark notum, pale fore coxae and apically brown fore femora. Unlike these other species, however, the fore tibia is yellow with brown mottling, the palpus is relatively thin, the male face is reddish, the distiphallus has a characteristic apical "coil" and the distal margin of the spermatheca is produced on one side (also seen in *H. hypoleuca*).

The two known females of this species are only tentatively included due to a relative lack of convincing autapomorphies. While they are similar to the males in overall colouration, other Australian *Heteromeringia* (such as *H. patula, H. stegna, H. macropa* and *H. montana*) are also similarly coloured, and a conservative approach will be taken because of the aforementioned sexual dimorphism characteristic of Old World *Heteromeringia*. Of these similar species, *H. macropa* has a thin palpus but the fore tibia is brown; *H. patula* (also with tentatively assigned females) has a mottled fore tibia, but tergite 1 is yellow, the mid coxa is brown, and the mid and hind femora have light brown spots.

Heteromeringia hypobrunnea n.sp.

Figs 38–40

Type material. HOLOTYPE: **Queensland**: Claudie R., 5 miles W Mt. Lamond, D.K. McAlpine & G.A. Holloway, 21.xii.1971 (1♂, AMS). PARATYPES: **Queensland**: Claudie R., 5 miles W Mt. Lamond, D.K. McAlpine & G.A. Holloway, 31.xii.1971 (1♂, AMS), 15.04S 145.07E, Mt. Webb Natl. Pk., rainforest, 29.iv.1991, D.H. Colless (1♂, ANIC), 13.43S 143.19E, McIlwraith Range, vi–vii.1989, Naumann (1♀, ANIC), Whitfield Forest Reserve, Cairns, 19.iv.1967, D.H. Colless (1♂, ANIC), 12.43S 143.17E, 9km ENE Mt. Tozer, 5–10.vii.1986, D.H. Colless (1♀, ANIC), 12.43S 143.18E, 11km ENE Mt. Tozer, 11–16.vii.1986, D.H. Colless (1♀, ANIC), 12.44S 143.14E, 3km ENE Mt. Tozer, 28.vi–4.vii.1986, D.H. Colless (2♂♂, ANIC; 1♂, DEBU; 1♂, USNM).

Description

Male. Body length 3.4–4.6 mm. Anepisternal disc present. First flagellomere orbicular. Bristles brown. Arista pubescent. Vibrissa relatively long and curved. Ocellar bristle minute. Two dorsocentral bristles. Gena shallow and not sharply angled. Face and buccal cavity pilose and meeting at an angle. Head mostly yellow; antenna (excluding arista) light yellow with dark inner-basal spot; back of head with one pair of brown stripes radiating from foramen; upper half of gena and anterodorsal half of occiput white and silvery tomentose; gena with central rusty spot; posterior half of occiput (excluding venter) brown; frons with pilose anteromedial and anterolateral patches. Scutum yellowish-orange with one pair of brown stripes uniting at anterior margin and with three pairs of brownish lateral spots. Scutellum yellowish-orange with lateral margin brown. Laterotergites yellowish-orange. Pleuron yellow with anterodorsal corner of anepisternum dark brown, posterior and dorsal margins of anepisternum rusty, and anepimeron brown. Legs yellow with fore tibia and tarsi dark brown, and fore femur with thin oblique inner-distal spot. Fore tarsi compressed laterally. Abdomen dark brown with tergites 1 and 2 orange-brown. M_{1+2} ratio 5.0. Wing lightly clouded. Halter white.

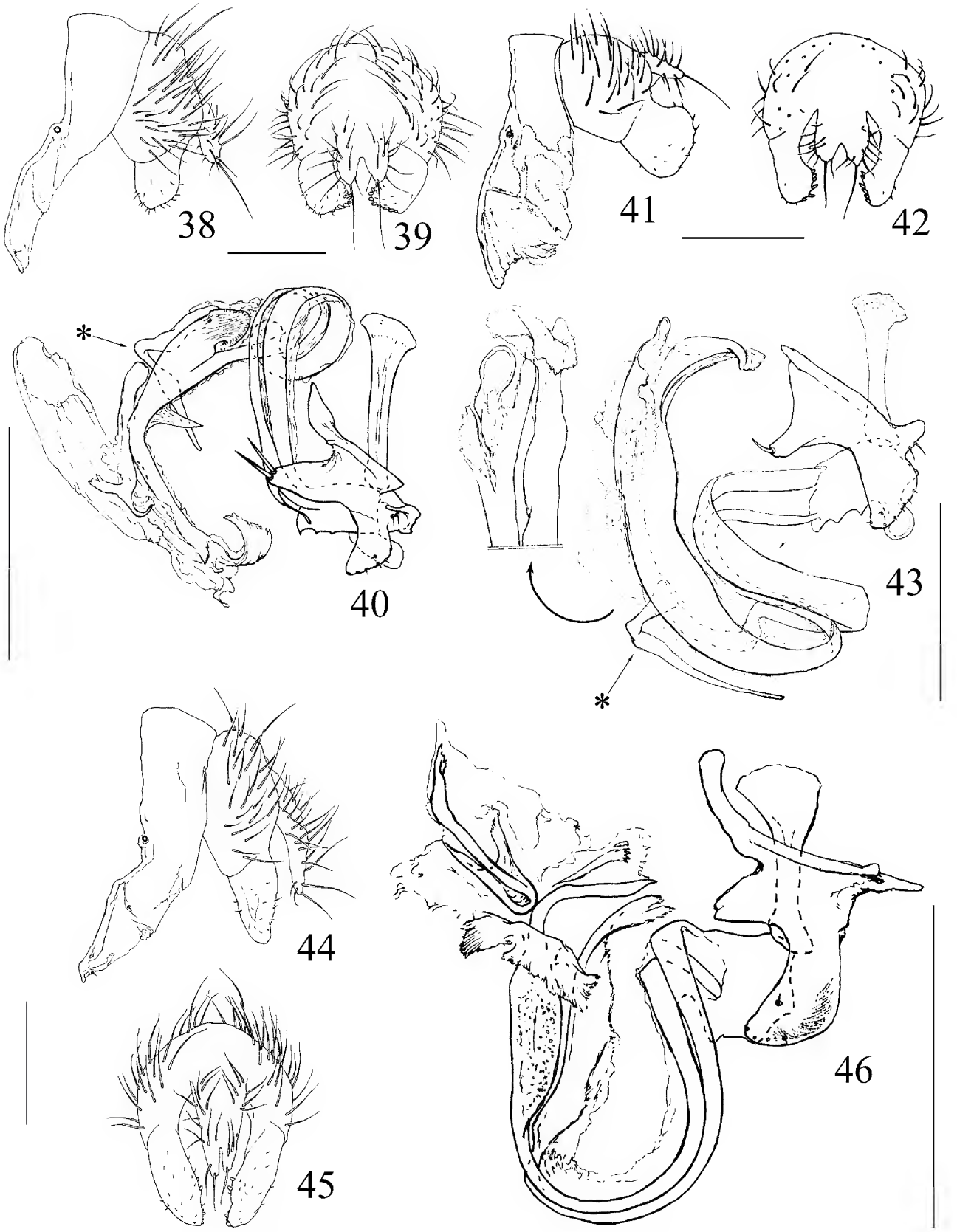
Female. As described for male except as follows: notal stripes wider and background of postsutural scutum orange; tergites 1 and 2 yellow laterally; terminalia yellow.

Male terminalia (Figs 38–40). Epandrium relatively small. Cerci thin and deeply emarginate. Surstylus small and rounded with apex slightly truncated and outer face setulose; inner-distal margin with numerous tubercle-like bristles. Hypandrium+pregonite with two thin divergent lobes (anterior lobe with two stout apical bristles and posterior lobe setulose distally). One rib of distiphallus thin, pointed and bent backwards, and one rib wide and elaborate apically with posteriorly-directed subapical lobe.

Female terminalia. Not dissected.

Etymology. The specific name notes the resemblance to the similarly-coloured *H. hypoleuca*, while indicating that the fore tarsi are brown (*-brunnea*), not white (*-leuca*)—the best character to use when separating the two species.

Comments. See comments for *Heteromeringia hypoleuca*.



Figures 38–46. Figs 38–40: male terminalia, *Heteromeringia hypobrunnea* n.sp.; (38) external, left lateral; (39) external, posterior; (40) hypandrial complex, left lateral. Figs 41–42: male terminalia, *H. digitula* n.sp.; (41) external, left lateral; (42) external, posterior; (43) hypandrial complex, left lateral. Figs 44–46: male terminalia, *H. hypoleuca* McAlpine; (44) external, left lateral; (45) external, posterior; (46) hypandrial complex, left lateral. Scale bar = 0.25 mm.

Heteromeringia hypoleuca D.K. McAlpine, 1960

Figs 16, 44–46, 95

Heteromeringia hypoleuca D.K. McAlpine, 1960: 72.

Type material. HOLOTYPE: **Queensland**: Lamington National Park, 29.x.1955, F.A. Perkins (1♂, QMBA). [not examined]. PARATYPES: **Queensland**: Laming N.P, 29.x.1955, F.A. Perkins (1♀, UQIC), Coolum, 20.ix.1938, F.A. Perkins (1♀, UQIC).

Additional material examined. **Queensland**: Kirrama r.f., swept ex. foliage, 11.viii.1976, Bock & Parsons (1♀, ANIC), 12.44S 143.14E, 3km ENE of Mt. Tozer, 28.vi–4.vii.1986, D.H. Colless (2♀♀, ANIC), 12.43S 143.17E, 9km ENE of Mt. Tozer, 5–10.vii.1986, D.H. Colless (1♀, ANIC), 15.50S 145.20E, Gap Ck., 5km ESE Mt. Finnigan, Malaise Trap, D.H. Colless, 15.v.1981 (1♀, ANIC), 14.v.1981 (1♂, ANIC), 15.47S 145.14E, Shiptons Flat, 18.v.1981, QLD, Malaise Trap, D.H. Colless (1♂, ANIC), Natural Bridge National Park, Numinbah, 7.vii.1978, carrion trap, S.&J. Peck (1♀, ANIC), Mt. Glorious, 1.ix–17.x.1990, Malaise, A. Hiller (1♂, ANIC), Brisbane Forest Pk., 27°25'05"S 152°50'13"E, Malaise over creek, 13–19.vi.1998, N. Power (1♂ 1♀, DEBU), N QLD, 10km S of Daintree, 25.iv.1967, D.H. Colless (1♂ 1♀, ANIC), Whitfield Ra. Forest Reserve, Cairns, 19.iv.1967, D.H. Colless (2♂♂, ANIC; 1♀, USNM), Mossman Gorge, 24.iv.1967 (1♂, USNM), Upp. Mulgrave R., 10 m, Goldsborough Rd., 9.v.1967, D.H. Colless (1♀, USNM), Mt. Edith Forest Road, 1.5 m off Danbulla Road, 6.v.1967, D.H. Colless (1♂, USNM), SE QLD, Tamborinae Mts., Eagle Heights, Palm Grove, 26.x.2002, 27.56S/153.12E, rainforest, Merz & Földvari (1♂, MHNG), Brisbane, Griffith Uni., Nathan Campus, 23.x.2002, 27.33S/153.04E, dry&wet sclrophyll forest, ferns, B. Merz (1♂, MHNG), 17.28S 145.29E, BS1, Longlands Gap, 1.viii–1.ix.1995, L. Umback, 1150 m, F1 Trap JCU (1♀, AMS), N QLD, Birthday Ck., 7 mi W Paluma, 15.i.1970, G.A. Holloway (1♂, AMS), 18.i.1967, D. McAlpine & G.A. Holloway (1♂, AMS), N QLD, Summit Walter Hill Ra., Cardstone–Ravenshoe Rd., 16.i.1967, D.K. McAlpine & G. Holloway (1♀, AMS), Mulgrave R., 4 mi W of Gordonvale, 21.v.1966, D.K. McAlpine (1♂, AMS).

Redescription

Male. Body length 3.1–4.2 mm. Anepisternal disc present. First flagellomere orbicular. Bristles brown. Arista short plumose. Vibrissa relatively long and curved. Ocellar bristle as long as ocellar tubercle. Two long, widely spaced dorsocentral bristles with anterior dorsocentral near suture. Gena relatively vertical and small. Anteroventral margin of palpus sometimes lightly infuscated. Face and buccal cavity meeting at an angle and shiny. Head yellow with frons dark brown medially (excluding posterolateral corners and deep anteromedial emargination), and brownish around base of vertical bristles, first flagellomere light yellow with orange tint on inner-distal margin, back of head dark brown above foramen, occiput brown, and parafacial, face and gena (excluding dirty yellow ventral margin) light yellow; gena silvery tomentose on dorsal half; frons with small pilose anteromedial spot. Scutum with one pair of dorsocentral stripes (sometimes quite faded) connected to large spot on anterior margin. Scutellum yellow with lateral margin brown. Laterotergites brownish. Pleuron yellow with brown spot on proepisternum above fore coxa and with oblique orange to dark brown subnotal stripe. If postsutural stripes faded, anepisternum and anepimeron entirely dark brown. Legs yellow with fore tarsi white (basal two and a half tarsomeres dark brown), fore tibia brown laterally, mid and hind femora light yellow, and fore femur with brown outer-distal and inner-distal spots. Fore tarsi compressed laterally. Abdomen dark brown. M_{1+2} ratio 6.0. Wing clouded along anterodistal margin and around cross veins (two clouds sometimes thinly connected). Halter white.

Female. Externally as described for male except as follows: colour sometimes slightly darker and markings more distinct; gena sometimes brown; anteroventral margin of palpus infuscated; third tarsomere of fore leg entirely white; abdomen sometimes with yellow anterolateral spots on middle segments.

Male terminalia (Figs 44–46). Epandrium small, shallow, relatively wide and perianal region deeply excavated. Cerci long, thin, tapering and emarginate. Surstylus subtriangular, higher than wide, setulose on outer face, and with tubercle-like bristles along apical and posterodistal margins of inner face. Anterior margin of hypandrium produced, and hypandrium+pregonite with small bare medial process and large, wrinkled setose posterior process (widest distally). Ribs of distiphallus of equal length, with one rib flared apically, and thick and textured subapically; with thin, transverse, folded apical sclerite.

Female terminalia (Fig. 95). Ventral receptacle narrow at base with flagellum long, thin and straight. Spermatheca smooth and approximately as wide as long with apical margin produced on one side.

Comments. The most widespread and frequently collected of the pale *Heteromeringia* in Australia is *H. hypoleuca*, which is found along most of the eastern coast of Queensland. Other pale species are found near the periphery of *H. hypoleuca*'s range to the south (*H. limacens*) and the north (*H. hypobrunnea* and *H. digitula*).

These other pale species can be separated from *Heteromeringia hypoleuca* by having apically to entirely brown (not white) fore tarsi. *Heteromeringia limacens* is further characterized by a single central notal stripe, an entirely (not centrally) yellow scutellum, yellow fore tibiae and black bristles—an unusual combination of characters that has allowed it to be described on the basis of females alone. The northern *H. hypobrunnea* and *H. digitula* are more similar to *H. hypoleuca* in having two notal stripes, but those of *H. digitula* are very thin and restricted to the postsutural scutum; the surstyli of *H. digitula* are also large and quadrate, making this an easily-recognized species. *Heteromeringia hypobrunnea* is almost identical in colouration to *H. hypoleuca* and may be easily confused; aside from the colour characters mentioned in the key (including entirely brown fore tarsi), *H. hypobrunnea* can be separated by having an anterior spine on the hypandrium+pregonite, a truncated surstylus and a recurved finger-like process on the phallus (the latter two are synapomorphies shared with its putative sister species, *H. digitula*).

Heteromeringia imitans Malloch, 1930

Figs 96–98

Heteromeringia imitans Malloch, 1930: 435. D.K. McAlpine, 1960: 72. Sasakawa, 1966: 97.
Heteromeringia immitans Frey, 1960: 23.

Type material. HOLOTYPE: **Queensland**: N Queensland, Cairns, 1907, coll. Liechtwardt (1♀, DEI).

Additional material examined. **New South Wales**: E NSW, Royal National Park, Otford/Werrong trck, 13.x.2002, 34.13S/151.01E, diff. types forest, sandy/strony[sic] beach, B. Merz (1♀, MHNG). **Queensland**: N QLD, Middle Claudie Riv., Iron Range, G. Daniels, 16.ix.1974 (1♀, AMS), 7.x.1974 (1♀, AMS), 15.10S 145.07E, 3.5km SW by S of Mt. Baird, 4.v.1981, D.H. Colless (1♀, ANIC), 12.43S 143.17E, 9km ENE of Mt. Tozer, 5–10.vii.1986, D.H. Colless (1♀, ANIC).

Type 2 females. **New South Wales**: Carrai SF, 30°59'45"S 152°16'23"E, 930 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CS-FZ-127-6 (1♀, AMS; 1♀, DEBU), Carrai SF, 31°00'19"S 152°16'24"E, 940 m, E. Tasker, 11–16.i.1998, sticky trap on *E. campanulata*, CS-GP-018-4 (1♀, AMS), Werrikimbe NP, 31°12'00"S 152°09'00"E, 1060 m, E. Tasker, 1–7. xii.1997, sticky trap on *E. viminalis*, WC-MR-127-6 (1♀, AMS), Tinda Creek, Putty Rd., 19.x.1993, D.K. McAlpine & B.J. Day (1♀, AMS).

Type 3 females. **Queensland**: 15.03S 145.09E, 3km NE of Mt. Webb, 30.iv.1981, D.H. Colless, at light (1♀, ANIC), 4km N Cardwell, Edmund Kennedy N.P., 28.iv.1994, ex. coastal for., B.J. Sinclair (1♀, CNC), The Boulders nr Babinda, 27.i.1991, McAlpine & B. Day (1♀, AMS).

Redescription

Male. Unknown.

Female. Body length 3.4–4.5 mm. Bristles black. First flagellomere orbicular. Arista pubescent. Vibrissa relatively long and curved. Ocellar bristle long and thin. Two dorsocentral bristles. Gena neither high nor strongly incurved. Face and buccal cavity lightly pilose and slightly curving. Head dark brown with anterior margin of frons sometimes orange (non-types), pedicel and scape orange, first flagellomere light yellow with anterior margin and distal ⅔ of inner face dark brown, and dorsal half of gena dirty orange and silvery tomentose; anterior ⅓ of frons pilose medially. Thorax dark brown. Legs yellow with apex of fore femur dark brown, fore tibia and tarsi dark brown, and coxae and base of femora white. Fore tarsi strongly compressed laterally. Abdomen dark brown with terminalia yellow. M_{1+2} ratio 8.0; length between cross veins approximately as long as dm-cu. Wing darkly clouded (fading past midpoint of third radial cell). Halter white with stalk and base of knob black.

Female terminalia (Fig. 96). Ventral receptacle broadly rounded with flagellum long and straight. Spermatheca longer than wide, rounded at ends, slightly wrinkled along inner-basal surface and with pale speckles medially.

Variation

AMS females differ as follows: head entirely dark brown to black; palpus approximately twice as high; terminalia entirely dark brown.

"Type 2" females differ as follows: palpus small and thin (nearly cylindrical in cross section); knob of halter white (possibly brown in two specimens); legs dark brown with fore coxa and basal half of fore femur white, base of mid and hind femur white, and mid and hind tibiae sometimes paler with distal ¼ yellow; first flagellomere black, usually with base and inner-ventral margin yellow; face, parafacial and anterior half of gena sometimes yellowish-orange and only base of fore femur yellow; spermathecae without "freckles", slightly wider at base and with subapical flagellum coiled (Fig. 97).

"Type 3" females differ as follows: ocellar bristle as long as ocellar tubercle; relatively well developed setula (c. ⅓ length anterior dorsocentral) in front of anterior dorsocentral; body (including halter in ANIC and CNC specimens) almost entirely dark brown with inner half of mid coxa yellow, antenna (excluding arista) yellow with first flagellomere black on anterior margin and inner-distal half, mid and hind tibiae dark yellow with base darker, and mid and hind tarsi yellow; frons shiny; wing dusky along anterodistal margin; M_{1+2} ratio 4.6. Sternite and tergite 8 entirely fused; sternite 8 with two small, overlapping, unpigmented posteromedial circles. CNC female paler: legs yellow with mid and hind coxae brown and fore tarsi, tibia and inner-distal spot on fore femur dark brown; parafacial rusty and apex of palpus yellow; spermathecal duct (Fig. 98) nearly twice length of that in ANIC female.

Comments. D.K. McAlpine (1960) mentioned that the stalk of the halter is brown in this species, but it appears to be blacker in hue with the pigment extending to surround much of the base of the knob. Most other Australian *Heteromeringia* with a completely or predominantly dark thorax have the stalk tinged with brown, at least basally; similar brown pigmentation is found in all Afrotropical species and several Oriental and Oceanian species, although the colour is usually also restricted to the base.

In addition to the "typical" *Heteromeringia imitans* females described above, there are eight additional females representing two distinctly different morphologies. While these females may belong to separate species, the striking variation characteristic of Old World *Heteromeringia* demands that extra caution be taken when delineating lineages represented by females alone. In "type 2" females, the head is most distinct: it is almost entirely black, excluding the scape, pedicel, and (sometimes) the base of the first flagellomere, as well as either the mentum and labellum or the face and anterodorsal margin of the gena. The head is also relatively round and shiny (excluding a dorsal pilose stripe on the gena) and the palpus is very thin and cylindrical. A similarly thin palpus is only otherwise seen in *H. trisetosa, H. helina*, some *H. spinulosa* and the species related to *H. laticornis*, but the presence of a coiled (not straight) flagellum on the ventral receptacle would seem to exclude any relationship with these species. "Type 3" females also have entirely dark forelegs and an entirely dark and shiny head, although the antenna is yellow with the anterior margin and inner-distal half of the first flagellomere is black. The rest of the body is also very dark, excluding parts of the mid and hind legs, and there is a relatively well developed setula in front of the anterior dorsocentral (approximately ⅓ length of anterior bristle).

Heteromeringia laticornis D.K. McAlpine, 1960

Figs 14, 47–49, 99

Heteromeringia laticornis D.K. McAlpine, 1960: 76.

Type material. HOLOTYPE: **New South Wales**: National Park, 19.iii.1957, D.K. McAlpine (1♂, AMS). PARATYPE: **New South Wales**: Otford, 12.x.1957, D.K. McAlpine (1♂, AMS).

Additional material examined. New South Wales: E NSW, Royal national Park, E Waterfall rail.stat., 12.x.2002, 34.09S 151.01E, B. Merz, diff. types forest (2♂♂, MHNG), Otford, 18.i.1964, D.K. McAlpine (1♂, AMS), Mooney/Mooney Creek near Gosford, 29.ii.1975, D.K. McAlpine (1♂, AMS), Tubrabucca, Upper Hunter Dist., 21.xii.1975, G. Daniels (1♀, AMS), "Lorien", 3km N Lansdowne, rainfor. edge, Malaise, 15–22.ii.1987, G. Williams (1♂, AMS), Carrai SF, 30°59'45"S 152°16'23"E, 930 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. cameroni*, CS-FZ-018-2 (3♂♂ 1♀, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 11–16.i.1998, sticky trap on *E. campanula*, CC-DP-018-2 (3♂♂, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CC-DP-018-4 (1♀, AMS; 1♀, USNM), Carrai SF, 30°54'35"S 152°16'26"E, 1090 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CC-FK-018-5 (2♂♂, AMS), Carrai SF, 30°54'35"S 152°16'26"E, 1090 m, E. Tasker, 11–16.i.1998, sticky trap on *E. campanulata*, CC-FK-127-4 (1♀, AMS), Carrai SF, 31°00'19"S 152°16'24"E, 940 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CS-GP-018-4 (3♂♂ 1♀, AMS), Carrai SF, 30°59'45"S 152°16'23"E, 930 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CS-FZ-127-3 (7♂♂ 2♀♀, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. obliqua*, CC-DP-127-5 (1♀ 1♂, DEBU), Carrai SF, 30°58'48"S 152°17'06"E, 975 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. viminalia*, CS-RO-127-2 (1♂ 1♀, AMS), Carrai SF, 30°58'48"S 152°17'06"E, 975 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CS-RO-018-5 (2♂♂, AMS; 1♀, DEBU), Carrai SF, 30°54'33"S 152°16'28"E, 1075 m, E. Tasker, 11–16.i.1998, sticky trap on *E. campanulata*, CC-CR-018-6 (2♂♂, AMS; 1♂, DEBU), Carrai SF, 30°54'33"S 152°16'28"E, 1075 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-CR-127-2 (1♂, AMS), Carrai SF, 30°54'19"S 152°17'36"E, 1075 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. cameronii*, CC-DP-127-6 (1♂, USNM), Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-DP-127-4 (2♂♂ 2♀♀, AMS), Werrikimbe NP, 31°12'00"S 152°09'00"E, 1060 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. obliqua*, WC-MR-127-2 (1♂, AMS), Werrikimbe NP, 31°16'50"S 152°03'19"E, 1045 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. campanulata*, WS-FC-127-1 (2♂♂, AMS), Werrikimbe NP, 31°16'50"S 152°03'19"E, 1045 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. saligna*, WS-FC-127-5 (1♂, AMS). **Northern Territory**: East Jabiru, 24–28.v.1988, A. Wells, yellow pan trap (1♀, ANIC). **Queensland**: trib. Krombit Ck., Krombit Tops SF, gully r.f. & wet sclera., 31.x–2.xi.1997, sticky trap on *E. saligna*, D. Bickel (1♀, AMS). **South Australia**: Mt. Barker (summit), iii–iv.1988, A.D. Dustin, M/trap (4♀♀, ANIC). **Tasmania**: Rosebery, ii.1977, BPBM (1♀, AMS).

Redescription

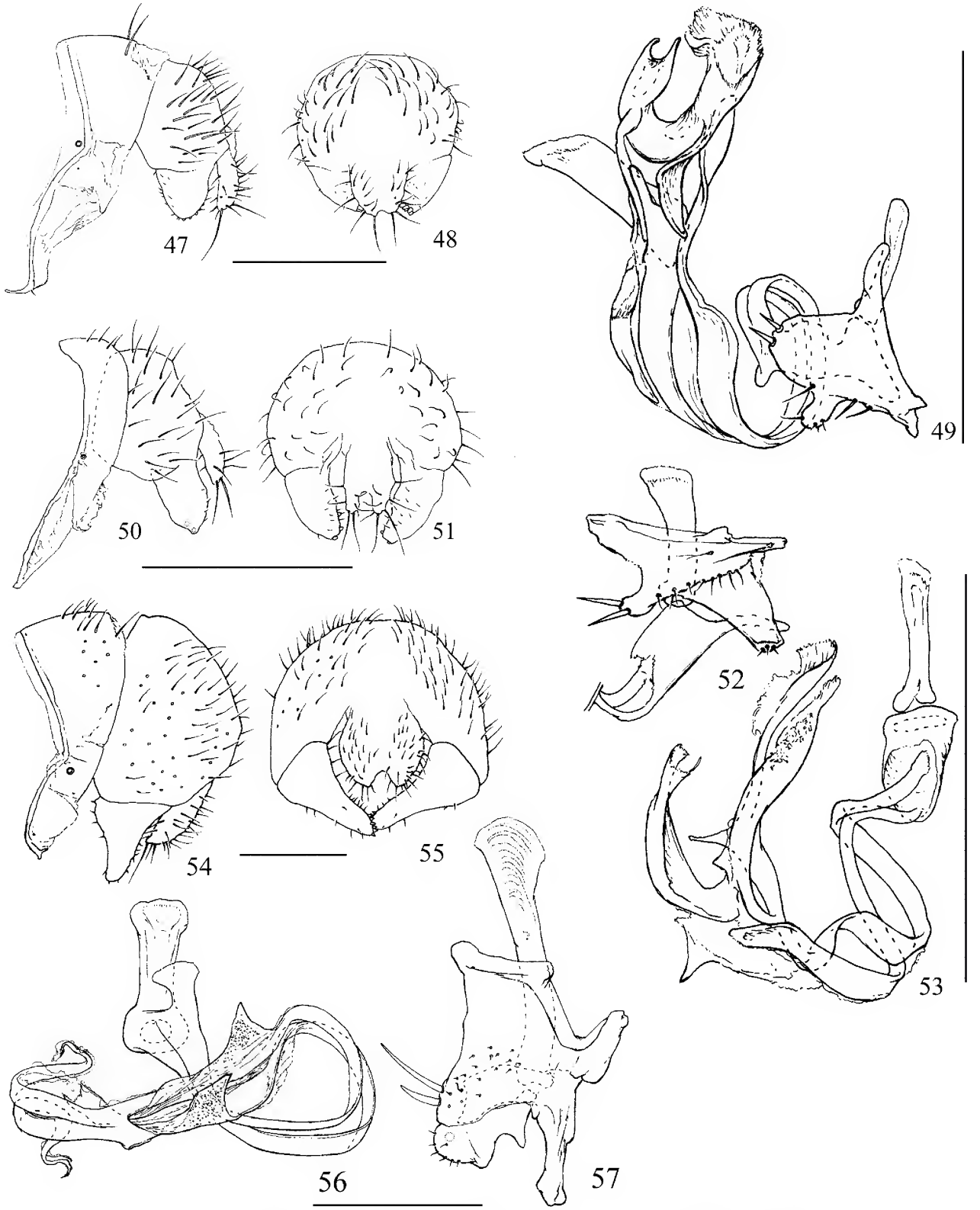
Male. Body length 2.4–3.0 mm. Anepisternal disc present. First flagellomere recessed dorsally and lobate ventrally (as in Figs 3, 4). Bristles black. Arista pubescent. Vibrissa short and straight. Ocellar bristle long and thin. Two dorsocentral bristles. Gena high and sharply incurved medially at mid-height. Face and buccal cavity evenly curving and velvety. Head yellow with posterior ⅔ of frons (excluding yellowish lateral and posterior margins), back of head, occiput, clypeus and posterior ⅓ of gena dark brown; first flagellomere variable, ranging from entirely yellow to entirely dark brown (excluding base); dorsal half of gena silvery tomentose; anterior ⅔ of frons pilose. Thorax dark brown. Fore femur dark brown on distal ⅓ (slightly more extensive on inner face); hind femur dark brown on distal half (excluding knee); fore tarsi dark brown, sometimes with distal segment lighter; fore tibia lighter on basal half with inner apex brownish; fore coxa white with dark yellow to light brown spot on outer base (sometimes developed into elongate brown stripe or fore coxa brown on posterior half); mid coxa dark brown on outer-dorsal half; remainder of legs yellow; sometimes legs (excluding fore coxa) dark brown with base of femora, knees and apex of mid and hind tibiae yellow, and mid and hind tarsi light brown. Fore tarsi ovate in cross section. Abdomen dark brown. M_{1+2} ratio 7.3. Wing with anterodistal infuscation; remainder of wing sometimes dusky. Halter white with base and side of stalk infuscated.

Female. As described for male except as follows: first flagellomere slightly more orbicular; mid and hind femora dark brown with base and apex yellow; fore tibia entirely dark brown excluding yellow base; mid and hind tibiae sometimes dark brown excluding base and apex, or entirely yellow; mid and hind tarsi light brown to yellow; fore tarsi with slight to pronounced lateral compression; frons shiny and black with anterior margin yellow (sometimes more extensively orange or yellow on anterior and anterolateral margins); palpus occasionally brownish apically.

Male terminalia (Figs 47–49). Height and length of epandrium ⅔ width. Cerci relatively small and rounded with shallow apical emargination. Surstylus small and rounded with numerous inner-distal tubercle-like bristles. Hypandrium+pregonite with large anterior lobe with two stout bristles, and small posterior lobe with several setulae. Phallus with thin longitudinal sclerite at midpoint, stouter laterally-projecting subapical sclerite (width varying), and large U-shaped apical sclerite with two basal processes.

Female terminalia (Fig. 99). Tergite 8 wrapping around segment posteriorly, enclosing sternite 8 distally. Ventral receptacle narrowing apically and flagellum very long and straight. Spermatheca as wide as long, smooth and with several basal wrinkles.

Comments. The species *Heteromeringia laticornis, H. hardyi* and *H. magnicauda* appear to be closely related on the basis of a number of putative synapomorphies: the vibrissae are short and straight, the gena is relatively high and sharply curved inwards, and the first flagellomere is lobate ventrally and recessed dorsally (sometimes indistinct), shifting the arista closer to the pedicel. *Heteromeringia helina* and *H. trisetosa* may be basal to this group since they share a similar gena and the male fore tarsi are similarly ovate in cross section; the distiphallus and hypandrium of *H. helina* are also highly similar to those of *H. hardyi*.



Figures 47–57. Figs 47–49: male terminalia, *Heteromeringia laticornis* McAlpine; (47) external, left lateral; (48) external, posterior; (49) hypandrial complex, left lateral. Figs 50–53: male terminalia, *Heteromeringia macropa* n.sp.; (50) external, left lateral; (51) external, posterior; (52) phallapodeme and phallus, anterior; (53) hypandrial complex (distal portion of distiphallus removed), left lateral. Figs 54–57: male terminalia, *Heteromeringia magnicauda* n.sp.; (54) external, left lateral; (55) external, posterior; (56) phallus, anterior; (57) hypandrial complex (distal portion of distiphallus removed), left lateral. Scale bar = 0.25 mm.

Heteromeringia limacens n.sp.

Fig. 100

Type material. HOLOTYPE: **New South Wales**: Carrai SF, 30°54'35"S 152°16'26"E, 1090 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CC-FK-018-2 (1♀, AMS). PARATYPE: **New South Wales**: Carrai SF, 30°59'45"S 152°16'23"E, 930 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CS-FZ-127-6 (1♀, DEBU).

Description

Male. Unknown.

Female. Body length 4.8 mm. Bristles black. First flagellomere orbicular. Arista pubescent. Vibrissa relatively long and curved. Ocellar bristle approximately as long as postvertical. Two dorsocentral bristles. Gena relatively high and bent medially. Face and buccal cavity meeting at an angle. Head mostly yellow, sometimes with brownish-golden tint; first flagellomere brownish-orange; ocellar tubercle brown; frons golden-orange centrally; back of head with one pair of faded stripes radiating from foramen; upper half of gena silvery tomentose. Fore tarsi ovate in cross section. Scutum yellow with central spindle-shaped stripe and one pair of small faint spots at suture. Scutellum yellow. Laterotergites brownish laterally. Pleuron yellow with dorsal ⅓ of anepisternum dark brown, anepimeron brown, dorsal margin of katepisternum faded brown and meron light brown. Legs yellow with fore tarsi brown (first segment and base of second segment yellow), fore tibia with faint sub-basal band and fore femur with faint subapical band. Abdomen dark brown with segment 10 yellow. M_{1+2} ratio 5.1. Wing with faint anterodistal infuscation and light cloud around distal ⅓ of R_{4+5} (indistinct in one specimen). Halter white.

Female terminalia (Fig. 100). Sides of tergite 8 meeting at ⅔ length ventrally. Ventral receptacle thin and cylindrical; flagellum long and straight. Spermatheca longer than wide and with minute basal wrinkles; apex broadly rounded and invagination small and slightly offset.

Etymology. The specific name is derived from the Greek for slug (*limax*), describing the shape of the notal stripe.

Comments. See comments for *Heteromeringia hypoleuca*.

Heteromeringia macropa n.sp.

Figs 50–53, 101

Type material. HOLOTYPE: **New South Wales**: Upp. Kangaroo Riv. Nr. Yeola, 200 m, ex. rotting sticks on rainforest floor, coll. 3–4.iii.1983, Emg. 11.iii.1983 J.F. Lawrence (1♂, ANIC), PARATYPES: **New South Wales**: 3km N Lansdowne, 12.xii.1992, G. Williams, ex. *Cuttsia viburnea* flowers, subtropical rainforest (1♂, AMS), Upp. Kangaroo Riv. Nr. Yeola, 200 m, ex. rotting sticks on rainforest floor, coll. 3–4.iii.1983, Emg. 11.iii.1983 J.F. Lawrence (2♂♂, ANIC), Emg. 20–30.iii.1983 (3♂♂ 1♀, ANIC), Emg. 14.iii.1983 (1♂ 1♀, DEBU; 1♂, USNM, 1♂, ANIC).

Description

Male. Body length 2.8 mm. Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista closely pubescent. Vibrissa relatively long and curved. Ocellar bristle thin and longer than tubercle. Two dorsocentral bristles with small bristle in front of anterior dorsocentral. Gena shallow and not strongly angled or bent. Face and buccal cavity pilose and meeting at an angle. Frons brown on posterior half and along lateral margins of anterior half; anterior ⅗ of frons tomentose; clypeus brown; occiput, back of head, ventral and posterior margins of gena and palpus dark brown; lateral margin of face with thin brown line; first flagellomere with anterior margin and distal ⅓ of inner face brown; gena pilose. Thorax dark brown. Legs yellow with fore tarsi, fore tibia and apex of fore femur dark brown. Fore tarsi slightly compressed laterally. Abdomen brown. M_{1+2} ratio 9.0. Wing dusky. Halter brown with distal surface white.

Female. As described for male except frons entirely dark, gena more darkly pigmented and face and parafacial dark brown.

Male terminalia (Figs 50–53). Epandrium with length shorter than height and slightly more than half width. Surstylus higher than wide with sides parallel, apex pointed and inner face with two or three apical tubercle-like bristles. Cerci setose medially and apically, sides nearly parallel and apex emarginate. Hypandrium+pregonite with two small diverging lobes; posterior lobe truncated and setulose apically; anterior lobe with two stout apical bristles and ventral margin contiguous with single raised row of setulae continuing along lateral surface. Distiphallus with one rib ending medially and one rib trifid on distal half with several lateral spines.

Female terminalia (Fig. 101). Sternite and tergite 8 entirely fused with small posteromedial emargination ventrally. Spermatheca barrel-shaped and invaginated apically. Ventral receptacle curved and with subterminal flagellum straight and long.

Etymology. As several of the types were collected at Kangaroo River, the specific name is derived from the genus name for terrestrial kangaroos (*Macropus*).

Comments. See comments for *Heteromeringia patula*.

Heteromeringia magnicauda n.sp.

Figs 54–57

Type material. HOLOTYPE: **New South Wales**: Tahmoor, 28.x.1981, B.J. Day (1♂, AMS). PARATYPES: **New South Wales**: nr. Hartley Valley, 22.xi.1993, ex. dry sclerophyll tree trunks, B.J. Sinclair (1♂, CNC), Heathcote N.P., Kingfisher Pool, 16.x.1994, B.J. Sinclair, ex. dry eucalypt for. (1♂, CNC), Hartley Vale Rd., Blue Mountains, 26.x.1993, on smooth Eucalyptus bark, D.K. McAlpine & B.J. Day (2♂♂, AMS), 8km S Mt. Wilson, Blue Mts., 27.ix.1989, D.K. McAlpine (1♂, DEBU; 1♂, USNM). **Queensland**: Sluice Ck., 8km W by S Millaa Millaa, 25.iv.1981, D.H. Colless, at light (1♂, ANIC).

Description

Male. Body length 2.4–3.0 mm. Anepisternal disc present. First flagellomere recessed dorsally and lobate ventrally (as in Figs 3, 4). Bristles black. Arista pubescent. Vibrissa short and straight. Ocellar bristle long and thin. Two long dorsocentral bristles with small bristle in front of anterior dorsocentral. Gena high and sharply incurved medially at mid-height. Face and buccal cavity evenly blending and velvety. Frons dark brown with anteromedial margin orange to yellow (colour sometimes extending along lateral margin)

and lateral and posterior margins yellowish; first flagellomere with infuscation at base of arista; occiput, back of head and posteroventral corner of gena dark brown; dorsal half of face light yellow; buccal cavity, anterior portion of frons and dorsal ⅘ of gena pilose; mentum sometimes dark brown. Thorax dark brown. Fore tibia dark brown on distal ⅔ and fore femur light brown (darker on basal ¾–⅚) with knee yellow; fore coxa brownish at base; fore tarsi (ovate in cross section) yellow with distal two tarsomeres light brown (QLD specimens with all segments brown); dorsal margin of mid coxa brown to orange; mid and hind femora brown medially, mid tibia brown medially on inner face and hind tibia brown on basal half (sometimes mid and hind femora and tibiae entirely brown excluding base and apex); hind coxa brown; remainder of legs yellow. Abdomen dark brown. M_{1+2} ratio 6.4. Wing with anterodistal infuscation. Halter white with base and side of stalk infuscated.

Female. Unknown.

Male terminalia (Figs 54–57). Epandrium bulbous and larger than pregenitalic segments. Cerci rounded laterally and with apex narrow and emarginate. Surstylus triangular and strongly narrowed apically; bare on outer face and with inner-distal tubercle-like bristles. Phallapodeme relatively long and stout. Hypandrium+pregonite setulose medially and distally with two stout anteromedial bristles (inner-distal face with additional stout bristle); flat along anterior face and with suture on distal ⅓; distal margin notched. Basiphallus with dorsal process at point of attachment to distiphallus and fused to hypandrium+pregonite posterolaterally. Ribs of distiphallus of equal length, fused medially and with one pair of small membranous wings.

Etymology. The specific name refers to the strikingly large (Latin *magnus*) male genitalia (Latin *cauda*) of this species.

Comments. Although the male genitalia of this species are incredibly diagnostic—particularly the bulbous male epandrium—the only other potentially autapomorphic character is relatively pale fore tarsi. The fore tarsi are brown in the male from Queensland, however, and they are potentially brown in the as yet undiscovered females, since female *Heteromeringia* are often darker than their respective males, particularly on the fore legs. This suggests the possibility that females of *H. magnicauda* are inseparable from those of the similar *H. laticornis*.

Heteromeringia montana n.sp.

Figs 58–61

Type material. HOLOTYPE: **Queensland**: Kuranda, 6.x.2002, A. Freidberg (1♂, AMS). PARATYPE: **Queensland**: 12.43S 143.18E, 11km EnE of Mt. Tozer, 11–16.vii.1986, Malaise trap, D.H. Colless (1♂, ANIC).

Additional material examined ["species A" of D.K. McAlpine (1960)]: **New South Wales**: Bronte, near Sydney, 31.iii.1958 (1♂, AMS), Otford, Illawarra District, 26.i.1959 (1♀, AMS).

Description

Male. Body length 2.1 (NSW male), 3.0 (female), 3.5 mm (QLD males). Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista closely pubescent. Vibrissa relatively long and curved. Ocellar bristle thin and longer than tubercle. Two dorsocentral bristles with small bristle in front of anterior dorsocentral. Gena relatively high and bent medially. Face and buccal cavity pilose and meeting at an angle. Frons dark brown medially, fading to orange anteriorly, and with lateral margins yellowish; back of head dark brown above foramen; occiput dark brown (excluding venter); face brownish centrally; first flagellomere brown on ventral ¾ of anterior margin and on ventral half of inner face; remainder of head yellow; gena pilose on dorsal ⅓; anterior half of frons tomentose. Thorax dark brown. Legs yellow with mid and fore coxae dark brown dorsally, fore tibia brownish (darker apically), fore tarsi brown (and laterally compressed), fore femur with inner-distal spot and mid and hind femora with light, sparse mottling on posterior surface (sometimes forming complete band). Abdomen dark brown. M_{1+2} ratio 5.5–6.0. Wing with anterodistal infuscation. Halter white with colour of base and stalk indiscernible. NSW male differs in that distal ⅓ of femur brown, back of head and occiput entirely brown, inner-distal face of first flagellomere lightly infuscated, and face yellow.

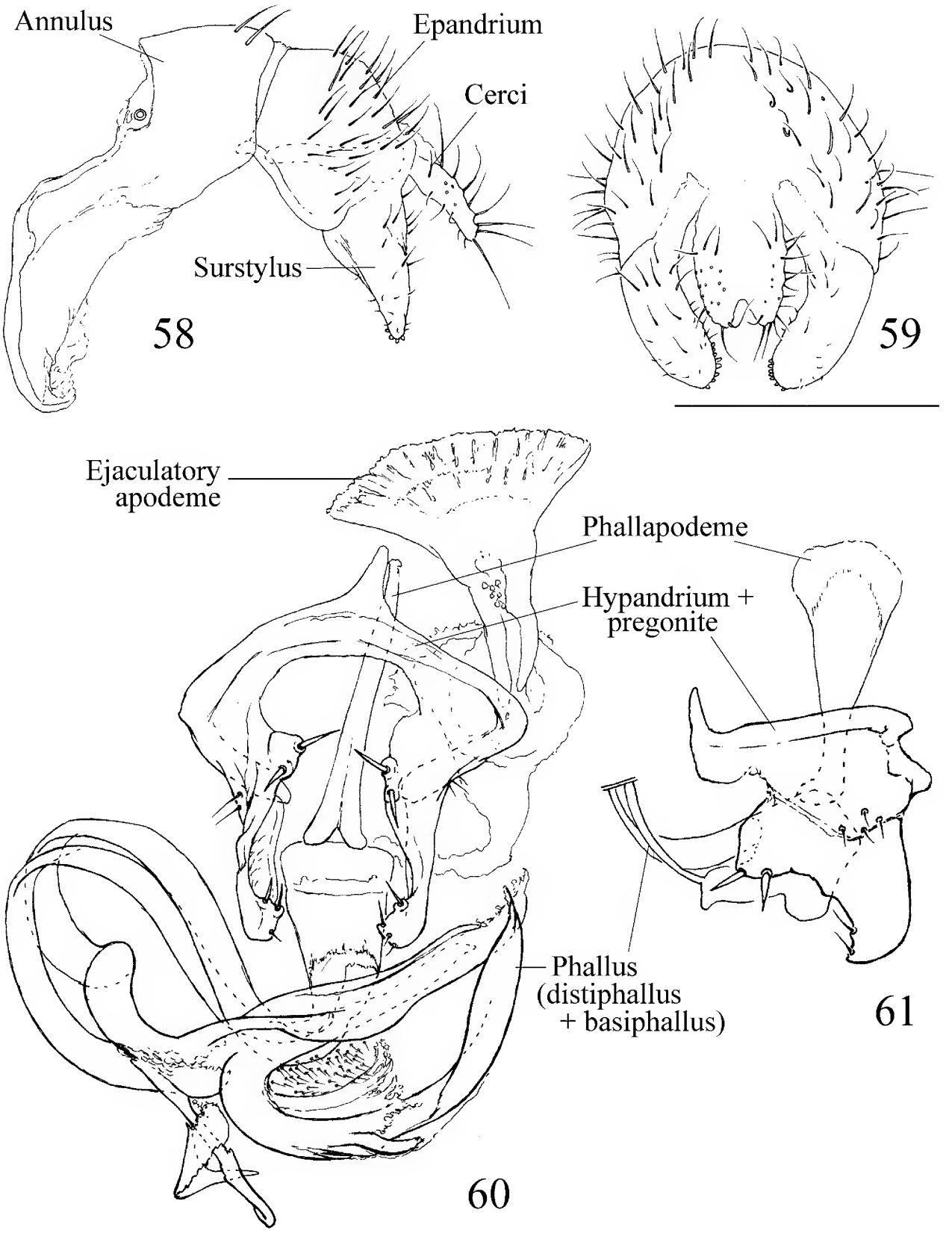
Female. As described for type males except as follows: fore tibia evenly brown; fore femur with light outer-distal spot; mid femur and coxa entirely yellow; frons shiny and brown on posterior ⅔; first flagellomere infuscated on distal half of inner face dorsally.

Male terminalia (Figs 58–61). Epandrium wider than long or high. Cerci widest medially and emarginate. Surstylus very dark and well sclerotized; elongate triangular in outline with apex rounded and curved inwards; anterior margin bare; tubercle-like bristles on inner-distal margin. Hypandrium+pregonite divided longitudinally by thin suture (dorsal section with several posterior setulae and ventral section recessed and bifid with several posterodistal setulae and two stout anterior bristles). Phallapodeme as high as hypandrium+pregonite and clavate (seen laterally). One rib of distiphallus ending medially; second rib with complex distal branching.

Female terminalia. Not dissected.

Etymology. The specific name is Latin for "mountain", and refers to the collection locality of the ANIC type specimen.

Comments. While the identity of the two specimens designated "species A" by D.K. McAlpine (1960) is still uncertain, they appear to be most closely allied to the above males examined from Queensland, and are here tentatively included in *Heteromeringia montana*. The male (not dissected) is similar to the types in that the fore tibia is entirely brown, the fore tarsi are ovate in cross section, the mid and hind femora are entirely yellow, the vibrissa is relatively long and the surstylus is more tapered apically. This male, however, is relatively small (2.1 mm), the gena is similar to that seen in *H. laticornis*, the first flagellomere is dorsally (not ventrally) infuscated, and the frons and fore femur are darker. The female is much more similar in appearance to the type specimens (particularly with regards to the colour of the head and legs), but because of the difficulty of associating Australian *Heteromeringia* females with males, this slightly dissimilar specimen is not included in the type series.



Figures 58–61. Male terminalia, *Heteromeringia montana* n.sp.; (58) external, left lateral; (59) external, posterior; (60) hypandrial complex, anterior; (61) hypandrial complex (distal portion of distiphallus removed), left lateral. Scale bar = 0.25 mm.

The genitalia are most similar to those of *Heteromeringia macropa*, but the surstylus is longer and more gradually tapered with additional tubercle-like bristles, the hypandrium differs in shape and chaetotaxy, and the phallus differs in the number and shape of medial processes. The surstylus is also similar to that of *H. helina*, but the internal genitalia are quite different. Externally, the type specimens can be mistaken for *H. patula*, but the anepisternum is shiny (not tomentose), the fore tibia is entirely brown, the frons and first flagellomere are darker and the scutum is not pale in the posterolateral corner.

Heteromeringia norrisi D.K. McAlpine, 1960

Figs 62–64

Heteromeringia norrisi D.K. McAlpine, 1960: 74.

Type material. HOLOTYPE: **Western Australia**: Applecross, 10.vi.1934, K.R. Norris, emerged from rotting wood 18.vii.1934 (1♂, ANIC).

Redescription

Male. Body length 3.0–3.8 mm. Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista closely pubescent. Vibrissa curved and relatively short (although not as short as vibrissa of *H. laticornis*). Ocellar bristle long. Two dorsocentral bristles (broken) with slightly more well developed setula in front of anterior dorsocentral. Occiput relatively large, and gena high and gradually curved medially. Face and buccal cavity evenly curving and velvety. Frons dark brown with anterior margin, posterior margin and faded spot in front of anterior ocellus brownish-orange; occiput and posterior half of gena brown; antenna (excluding arista) orange-yellow with anterodorsal margin and distal ⅓ of first flagellomere infuscated; distal ⅔ of palpus brown, (excluding inner margin); parafacial and dorsal half of gena silvery tomentose, frons broadly pilose anteriorly. Thorax dark brown. Fore legs dark brown with base of tibia yellow and fore coxa dirty yellow/light brown and silvery tomentose with base brown; mid tibia, coxa and femur dark brown with base and apex of femur yellow; mid tarsi yellow; hind coxa brown (remainder of hind legs missing—D.K. McAlpine [1960] describes those parts as dark brown with knee and middle of tarsi yellowish). Fore tarsi ovate in cross section. Abdomen dark brown. M_{1+2} ratio approximately 5.5. Wing only clouded along R_{2+3} and R_{4+5} on distal ⅓. Halter white with stalk brownish (darker to base).

Female. Not examined.

Male terminalia (Fig. 64). Epandrium largely obscured, but width, height and length appearing subequal. Cerci approximately half height of epandrium, narrowing distally and with small apical emargination. Surstylus long and triangular (strongly tapered on distal half) with several distal tubercle-like bristles.

Comments. *Heteromeringia norrisi* is one of only two *Heteromeringia* known from Western Australia. The other is the relatively widespread *H. trisetosa*, which also occurs in New South Wales, Queensland and Tasmania, and is characterized by three pairs of dorsocentral bristles.

One of the paratype females (not examined) was collected in a log with termites (D.K. McAlpine, 1960).

Heteromeringia patula n.sp.

Figs 65–68, 102

Type material. HOLOTYPE: **New South Wales**: Royal Natl. Pk., Scientists' Cabin Trail, creek bed, sweep, 25.xii.2003, S.A. Marshall (1♂, AMS). PARATYPES: **New South Wales**: same collection as holotype (1♂, DEBU), Otford, NSW, 29.ii.1964, D.K. McAlpine (1♂, AMS).

Additional material examined. New South Wales: Carrai SF, 30°54'19"S 152°17'36"E, 1055 m, E. Tasker, 3–8.xii.1997, sticky trap on *E. campanulata*, CC-DP-127-4 (2♀♀, AMS), Werrikimbe NP, 31°11'56"S 152°10'23"E, 1025 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. saligna*, WC-WN-127-6 (1♀, AMS).

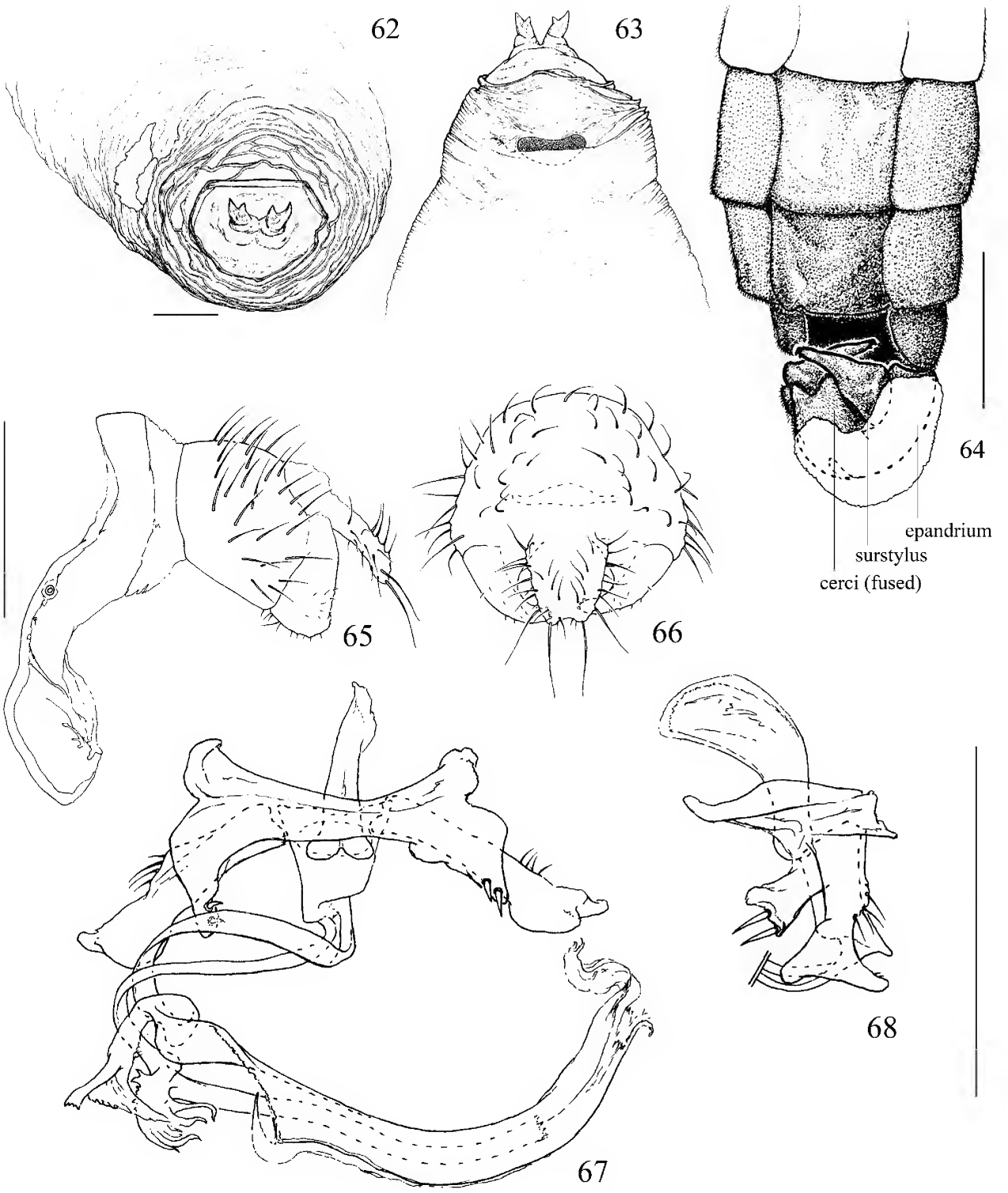
Description

Male. Body length 3.2–3.4 mm (male) and 4.0–5.8 mm (female). Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista closely pubescent. Vibrissa relatively long and curved. Ocellar bristle thin and longer than tubercle. Two dorsocentral bristles with small bristle in front of anterior dorsocentral. Gena shallow and not strongly angled or bent. Face and buccal cavity pilose and meeting at an angle. Posterior half of frons dark brown with lateral and posterior margins paler, and anterior half tomentose and bright yellow to orange anteriorly and laterally; occiput and back of head above foramen dark brown; distal margin and ventral ½–¾ of inner face of first flagellomere infuscated; ventral margin of gena shiny orange; remainder of head yellow; dorsal ⅔ of gena pilose. Thorax dark brown. Fore coxa white with outer base yellow to brown; mid coxa brown laterally; fore tarsi dark brown and ovate in cross section; fore tibia mottled brown laterally; fore femur with dark inner-distal spot and with variable brown mottling along length; basal ⅔ of mid and hind femora yellow, mottled brown, or with faint posterodorsal spot; remainder of legs yellow. Abdomen brown with tergite 1 yellow. M_{1+2} ratio 4.0–8.8. Wing with light anterodistal infuscation. Halter white with base and side of stalk infuscated.

Female. As described for male except as follows: postpronotum and notopleuron paler; mid coxa light brown dorsally; fore tibia dark brown; fore femur light yellow on basal half and dark brown on distal half; mid femur with light brown medial mottling; hind femur with nearly indistinct medial mottling; frons brownish orange (yellow laterally); apex of palpus infuscated; first flagellomere yellow with anterior and inner-distal margin brown; occiput yellow; gena and face bronze and frons yellow with medial bronze/brown tint; abdomen entirely brown; wing infuscated along distal half of anterior margin.

Male terminalia (Figs 65–68). Epandrium slightly higher than long and distinctly wider than high. Surstylus short and broadly triangular with apex rounded and posterior corner long and fused to epandrium. Cerci tapering apically and shallowly emarginate.

Hypandrium+pregonite with two stout bristles on anterior lobe, and very dark elongate posterior sclerite (wide and truncate distally with several posteromedial setae and several inner-distal setulae) that strongly projects laterally and is distinct even in non-dissected specimens. Phallapodeme thin, but relatively long, arched and broad distally. Ribs of distiphallus long, parallel and twisted medially.



Figures 62–68. Figs 62–64: *Heteromeringia norrisi* McAlpine; (62) puparium, posterior; (63) puparium, posterior, ventral; (64) abdomen, ventral. Figs 65–68: male terminalia, *Heteromeringia patula* n.sp.; (65) external, left lateral; (66) external, posterior; (67) hypandrial complex, anterior; (68) hypandrial complex (distal portion of distiphallus removed), left lateral. Scale bar = 0.25 mm.

Female terminalia (Fig. 102). Spermatheca slightly longer than wide, shallowly invaginated apically, dark, and with pronounced wrinkled collar. Spermathecal duct approximately four times length of spermatheca with apical section swollen. Ventral receptacle relatively large and recurved with flagellum long and loosely coiled.

Etymology. The specific name is Latin for "spread/extended", referring to the characteristic dark lateral processes on the hypandrium+pregonite.

Comments. The females listed above for *Heteromeringia patula* are only tentatively included in this species on the basis of medial pigmentation on the mid femur (uncommon

in species with otherwise pale mid and hind legs), more extensive pigmentation on the fore femur (present only as outer mottling in the males), and a relatively pale bronze-coloured frons (two males also have a bronze anteromedial tint). The pigmentation on the antenna, fore tibia and wing, however, is quite different.

Heteromeringia stegna, H. macropa, H. patula and *H. asteia* are similar in that they have small, rounded surstyli and an uneven U-shaped sclerite on the distiphallus (free or attached). The genitalia of *Heteromeringia patula* are easily separable from those of the other species in that the posterolateral sclerite of the hypandrium+pregonite is produced into a long, dark bar that projects laterally from the abdomen and is usually visible without dissection. Furthermore, *H. patula* has a brown halter, the male palpus and clypeus are yellow, tergite 1 is yellow, the scutum is yellowish posterolaterally, there is yellow mottling on the fore tibia and the first flagellomere has an inner-ventral infuscation.

Of the remaining three species, *Heteromeringia asteia* has darkly-patterned wings, *H. stegna* has a brown halter and a basally brown palpus, minute ocellar bristles, a shiny frons and heavily modified external male terminalia, and *H. macropa* has an entirely brown palpus, a ventrally brown gena, an entirely shiny (not posteriorly tomentose) anepisternum, a dusky wing, an anteriorly infuscated first flagellomere, a relatively long, pointed surstylus and a long series of setae on the hypandrium.

Heteromeringia ptenopa n.sp.

Figs 69–72, 103

Type material. HOLOTYPE: **Queensland**: 12.44S 143.14E, 3km ENE of Mt. Tozer, 28.vi–4.vii.1986, D.H. Colless, Malaise trap (1♂, ANIC). PARATYPE: **Queensland**: N QLD, Claudie R. near Mt. Lamond, 5.vi.1966, D.K. McAlpine (1♀, AMS).

Description

Male. Body length 3.9 mm. Bristles dark brown. First flagellomere orbicular. Arista short plumose. Vibrissa relatively long and curved. Ocellar bristle minute. Two dorsocentral bristles. Gena small and flat. Face and buccal cavity shiny and meeting at an angle. Head dark brown with antenna (excluding arista) dirty yellow, buccal cavity and mouthparts yellow with palpus brown, dorsal half of gena dirty yellow and silvery tomentose, and frons yellowish along posteromedial and lateral margins; frons shiny. Thorax dark brown with postpronotum yellow, and meron and katepisternum below level of anepisternum yellow. Legs yellow with fore coxa light yellow, fore tibia and tarsi dark brown, fore femur with inner-distal spot, mid tibia yellow and hind tibia light brown with base darker. Fore tarsi slightly compressed laterally. Abdomen dark brown with terminalia yellow. M_{1+2} ratio 6.0. Wing with relatively wide anterodistal infuscation. Halter white.

Female. As described for male except as follows: postpronotum brown; mid tibia brownish; head (excluding antenna) dark brown; wing clear.

Male terminalia (Figs 69–72). Epandrium with height, length and width subequal; perianal region deeply excavated. Cerci entirely united, long and subrectangular. Surstylus nearly as long as epandrium and rounded, with distal half wrinkled and curved inwards so that outer face only fully visible posteriorly; inner-distal margin with several tubercle-like bristles. Hypandrial complex relatively pale and gracile compared to other Australian species. Hypandrium + pregonite divided into thin anterior lobe with two stout apical bristles, and long, wide, posteriorly-directed setulose lobe with rounded posterobasal swelling. Ribs of phallus unequal in length, with one rib entirely thin and linear and ending at ⅔ length; longer rib abruptly bent apically and with two accessory sclerites near apex (one sclerite thin, tapered at both ends and lightly "feathered", and one smooth and deeply trifid.

Female terminalia (Fig. 103). Ventral receptacle weakly sclerotized and narrowing apically and flagellum long and straight. Spermatheca tapering apically, as wide as long and with shallow basal wrinkles.

Etymology. The specific name is derived from the Greek for "feathered" (*ptenos*), referring to the long-plumose arista characteristic of this species.

Comments. *Heteromeringia ptenopa* is distinct from most other Australia *Heteromeringia* in that the hairs on the arista are short-plumose, not pubescent, and the thorax is brown excluding most of the katepisternum. The only other species with a similar arista is *H. hypoleuca*, which has much different colouration.

Heteromeringia spinulosa D.K. McAlpine, 1960

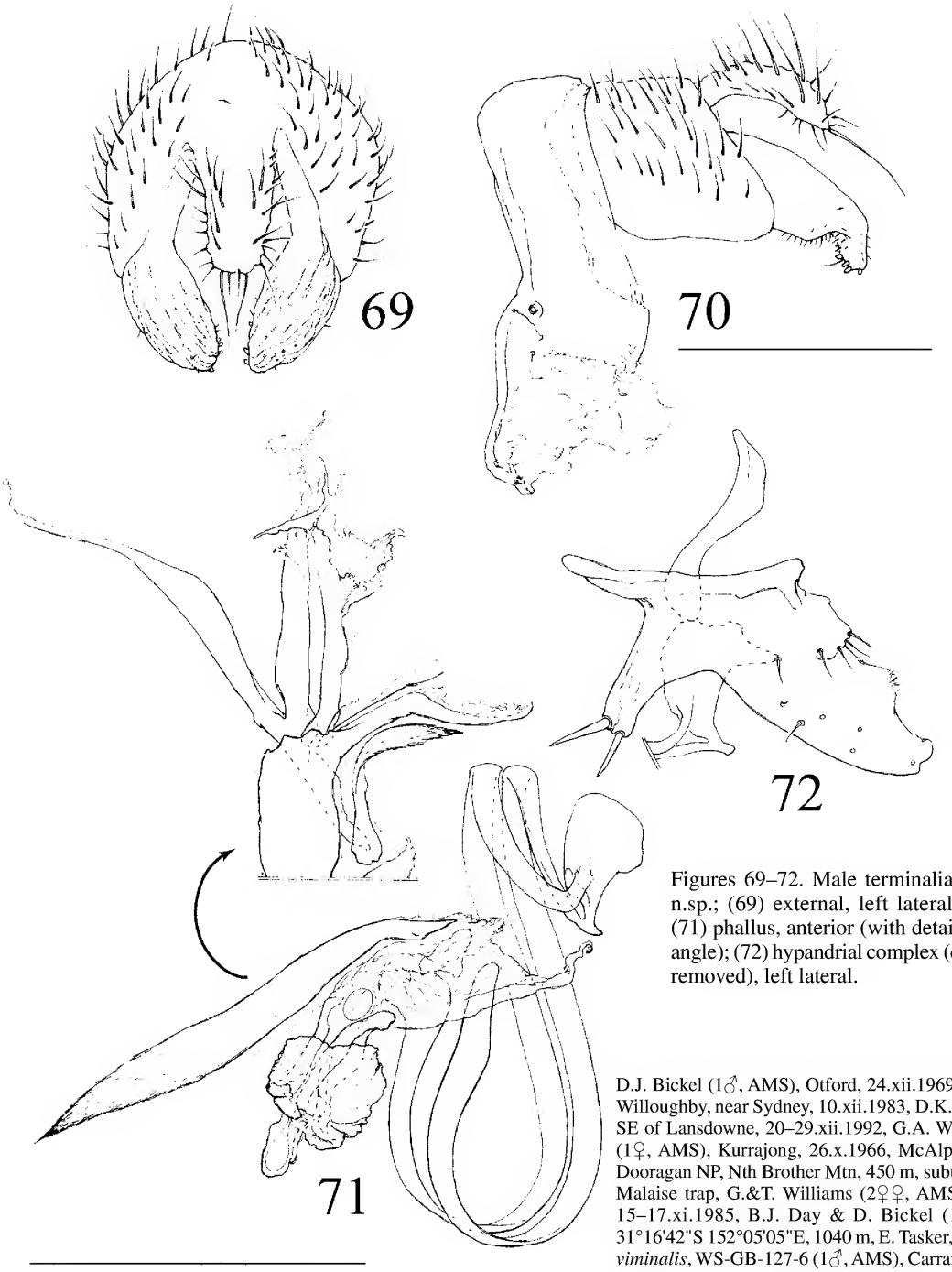
Figs 1, 2, 5, 11, 73–80, 104, 105

Heteromeringia spinulosa D.K. McAlpine, 1960:74.
Heteromeringia pulla D.K. McAlpine, 1960: 73, **new synonym**.

Holotype [*Heteromeringia spinulosa*]: **New South Wales**: Below Govett's Leap, Blue Mountains, 7.xii.1956, D.K. McAlpine (1♂, AMS). **Paratypes** [*H. spinulosa*]. **New South Wales**: Otford, 12.x.1957, D.K. McAlpine (1♂, AMS), Sydney, ii.1925, Health Department (1♀, AMS) [allotype of *H. australiae*].

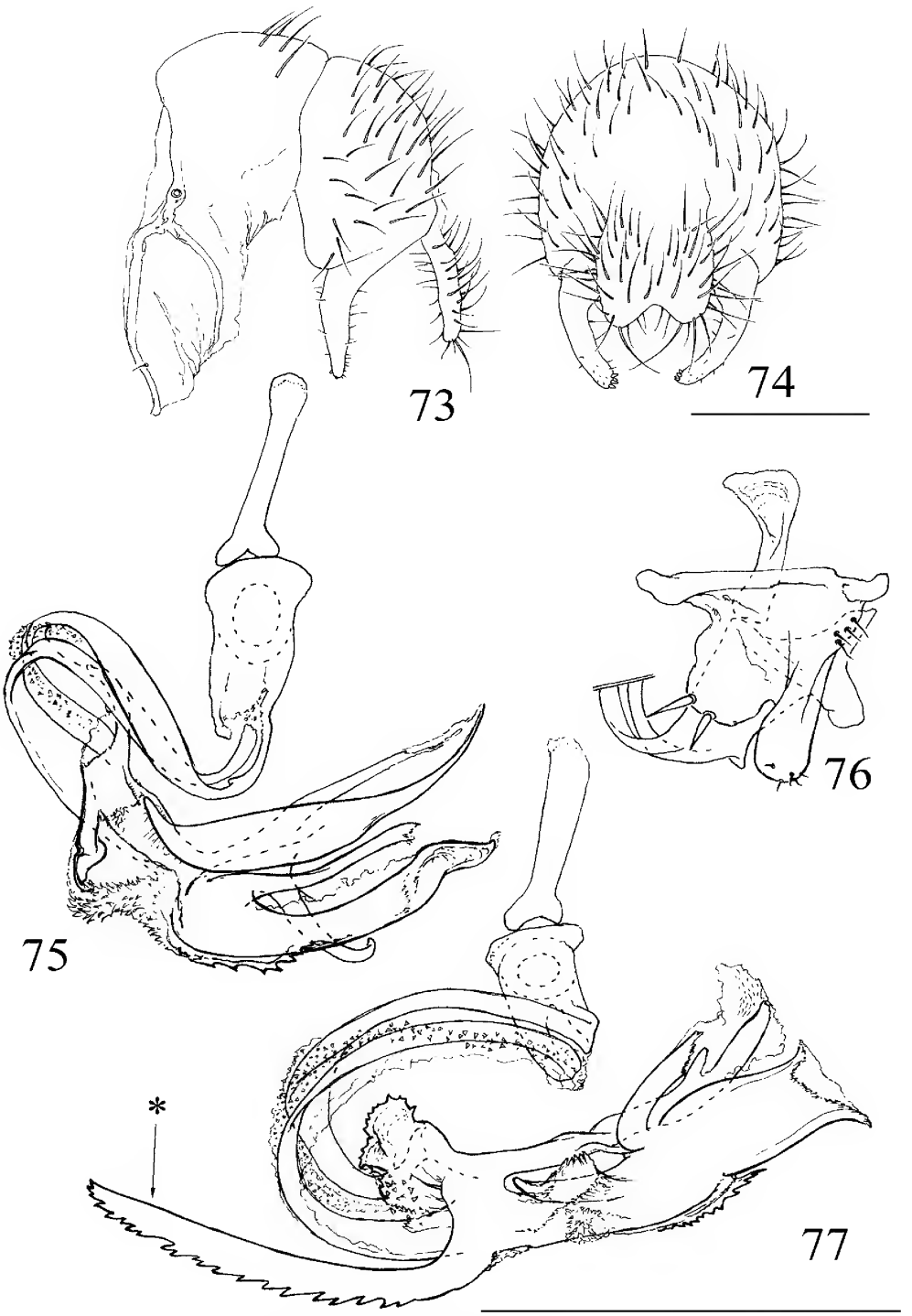
Holotype [*Heteromeringia pulla*]. **New South Wales**: National Park, 13.iv.1954, D.K. McAlpine (1♂, AMS). **Paratypes** [*H. pulla*]. **New South Wales**: National Park, D.K. McAlpine, 13.iv.1954 (2♂♂, AMS), 20.iv.1954 (4♂♂, AMS), Otford, 26.i.1959, D.K. McAlpine (1♂, AMS).

Additional material examined. Australian Capital Territory. Black Mtn., Malaise, site 1, D.H. Colless, 20.ii.1980 (1♂ 1♀, ANIC), 18.ii.1980 (1♂, ANIC), 4–5.iii.1980 (1♂, ANIC), 29.xi.1979 (1♀, ANIC), 30.xi–2.xii.1979 (1♀, ANIC), 4.ii.1980 (1♀, ANIC), 14.ii.1980 (1♂, ANIC), 21.ii.1980 (1♂, ANIC), 25.ii.1980 (1♂, ANIC), 8–10.ii.1980 (1♀, ANIC), 2–3.ii.1980 (1♀, ANIC), 20.xi. 1980 (1♀, ANIC), 19.xi.1979 (2♂♂, ANIC), 28.ii.1980 (1♀, ANIC), 17–18.xi.1979 (1♀, ANIC), 29.ii.1980 (1♂ 1♀, ANIC), 15–17. iii.1980 (1♀, ANIC), 15–17.xii.1979 (2♂♂, ANIC), 29.ii–2.iii.1980 (1♂ 1♀, ANIC), Black Mtn., xii.1987, M. Irwin, Malaise trap (2♂♂ 2♀♀, ANIC), Blundells Ck., ii.1987, D.H. Colless, Malaise trap (2♀♀, ANIC). **New South Wales**: Katoomba, 19.xi.1963, G.H. Hardy (1♂, AMS), 8.xii.1961 (2♀♀, AMS), Sassafras Gully, Springwood, 23.ix.1972, D.K. McAlpine (1♂, AMS), Wright's Lookout, New England National Park, 1.iv.1961, D.K.



Figures 69–72. Male terminalia, *Heteromeringia ptenopa* n.sp.; (69) external, left lateral; (70) external, posterior; (71) phallus, anterior (with detail of phallus tip in different angle); (72) hypandrial complex (distal portion of distiphallus removed), left lateral.

McAlpine (1♀, AMS), Roberts Creek near East Kurrajong, 1.i.1962, D.K. McAlpine (1♀, AMS), Mooney Mooney Creek near Gosford, 20.xi.1975, D.K. McAlpine (1♂, AMS), 25.xi.1975 (1♂, AMS), 9.xi.1976, in copula (1♂ 1♀ [same pin], AMS), 11.xii.1981, B.J. Day (1♀, AMS), 16.xi.1978, D.K. McAlpine & B.J. Day (1♂, AMS), 25.xi.1975, D.K. McAlpine & B.J. Day (1♂, AMS), 6.xii.1977, D.K. McAlpine & B.J. Day (1♂, AMS), 1.xii.1989, D.K. McAlpine & B.J. Day (1♂, AMS), National Park, 19..iii.1961, D.K. McAlpine (1♀ 1♂ [same pin], AMS), Brown Mtn. nr. Nimmitabel, 13–19.ii.1987, 1200 m, warm temp. rf., D. Bickel (1♀, AMS), Royal NP, 12.ii.1985, Bela Ck., closed for., D. Bickel (1♂, AMS), Royal National Park, 19.xii.1970, D.K. McAlpine (1♂, AMS), Careel Bay, 14.iii.1963, Casuarina swamp, D.K. McAlpine (1♂ 1♀, AMS), ne Camden Head SEPP 26 site 122, littoral r'for, G.&T. Williams, Malaise trap, 24.xii.1999–4.i.2000 (1♀, AMS), Sullivan Gap FR, nr. Buladelah, 3–16.i.1988, yellow pan trap, D.J. Bickel (1♂, AMS), Otford, 24.xii.1969, D.K. McAlpine (1♂, AMS), Willoughby, near Sydney, 10.xii.1983, D.K. McAlpine (1♀, AMS), 0.5km SE of Lansdowne, 20–29.xii.1992, G.A. Williams, ex. riverine rainforest (1♀, AMS), Kurrajong, 26.x.1966, McAlpine & Holloway (1♀, AMS), Dooragan NP, Nth Brother Mtn, 450 m, subtr. Rainfor., 25.xi–26.xii.1999, Malaise trap, G.&T. Williams (2♀♀, AMS), Mt. Royal near Singleton, 15–17.xi.1985, B.J. Day & D. Bickel (1♂, AMS), Werrikimbe NP, 31°16'42"S 152°05'05"E, 1040 m, E. Tasker, 1–7.xii.1997, sticky trap on *E. viminalis*, WS-GB-127-6 (1♂, AMS), Carrai SF, 30°59'45"S 152°16'23"E, E. Tasker, 930 m, 24–30.iv.1998, sticky trap on *E. cameronii*, CS-FZ-048-5 (1♂, AMS), 11–16.i.1998, sticky trap on *E. obliqua*, CC-FK-018-5 (2♀♀, USNM), 11–16.i.1998, sticky trap on *E. campanula*, CC-CR-018-6 (1♀, AMS), 3–8.xii.1997, sticky trap on *E. viminalis*, CS-RO-127-1 (1♀, AMS), Deua NP, Wyanbene Caves Cpgd., 800 m, 35°45'30"S 149°39'30"E, sticky trap, trunk, wet sclera. for., D. Bickel, 16.xii.2000 (1♀, AMS), 3km N Lansdowne via Taree, Lorien Wildlife Refuge, 50 m, 20–27.xii.1990, Malaise trap, D. Pollock & L. Reichert (1♂, USNM), Royal Natl. Pk., Scientists' Cabin trail, creek bed, sweep, 25.xii.2003, S.A. Marshal (2♀♀, DEBU) [one with abdomen missing], Upp. Kangaroo Riv., nr. Yeola, 200 m, J.F. Lawrence, ex. rotting stick on rainforest floor, coll 3–4.iii.1983, Emg. 11.iii.1983 (1♂, ANIC), Emg. 9.iii.1983 (1♀, ANIC), Emg. 20–30.iii.1983 (1♂ 2♀♀, ANIC), Emg. 15–20.iii.1983 (1♀, ANIC), Monga State Forest, 24.i.1984, L. Masner (1♀, CNC), 19–24.i.1984 (1♀, CNC). **Queensland**: Monto District, Bulburin (Austral), Site 3, 24°34'S 151°29'E, 580 m, creek bed, 20.iii.1975, D.K. McAlpine (1♂, AMS), Austral Forest via Bulburin, Site 3, 24°34'S 151°29'E, 22.iii.197, Malaise trap, D.K. McAlpine (1♂, AMS), Great Sandy Nat. Pk., Cooloola Section, 25°56'49"S 153°05'30"E,



Figures 73–77. Male terminalia, *Heteromeringia spinulosa* McAlpine; (73) external, left lateral; (74) external, posterior; (75) phallapodeme and phallus, anterior (phallic blade absent phenotype); (76) hypandrial complex (distal portion of distiphallus removed), left lateral; (77) phallapodeme and phallus, anterior (phallic blade (*) present phenotype). Scale bar = 0.25 mm.

1–5.x.1996, D.K. Yeates, G. Lambkin & S. Winterton, Malaise trap (2♂♂, UQIC), Cooloola NP, Freshwater Lake, 27.xi.1985, D. Bickel & G. Cassis (1♂, AMS), Bunya Mtns NP. At Rd. to Nanaga, rainfor., 960 m, 26.xi.1992, yell. Pans, D.J. Bickel (1♀, AMS), SE QLD, Mt. Glorious, Rainforest Circuit tr, 24.x.2002, 27.20S/152.46E, rainforest, Merz, Földvari & McNeil (2♂♂, MHNG), SE QLD, Brisbane, Griffith Uni., Nathan Campus, 23.x.2002, 27.33S/153.04E, dry&wet sclrophyll forest, ferns, B. Merz (1♂, MHNG), Mt Glorious, 27°19'54"S 152°45'29"E, Malaise, 24–30.i.1998, T. Hiller (2♂♂ 1♀, DEBU), 24–30.xi.1997 (1♂, DEBU), 3–9.i.1998 (1♂ 2♀♀, DEBU), Brisbane Forest Pk., Scrub Creek Rd., 27°25'41"S 152°50'15"E, yellow pans, 29.ix.2002, C.R. Nelson (1♂, DEBU), SE QLD, Tamborine Mts., Eagle Heights, Palm Grove, 26.x.2002, 27.56S/153.12E, rainforest, Merz & Földvari (1♂, MHNG), N QLD, the Crater near Herberton, 16.xii.1961, D.K. McAlpine (1♂, AMS), Birthday Crk, near Paluma, N Qld, 18.i.1967, D.K. McAlpine & G. Holloway (1♂, AMS; 2♂♂, USNM), 14.i.1970, G.A. Holloway (1♂, AMS), Skywindow Lookout, Eungella Nat. Pk., 8–9.v.1980, I.D. Naumann & J.C. Cardale, Malaise trap (1♀, ANIC), N Qld, Julatten, A. Walford-Huggins, edge of rainforest along creek, ex.

intercept trap, 30.xi–13.xii.1987 (2♂♂ 1♀, ANIC), 5.x.1987 (1♀, ANIC), 13.32S 143.19E, McIlwraith Range, vi–vii.1989, I. Naumann (1♂, ANIC), Sirakan, ii.1924, G.H. Hardy (1♀, UQIC), Atherton Tablelands, Lake Eacham, sweep, 5–8.iv.1999, S.A. Marshall (1♀, DEBU), Brisbane Forest Pk, 27°25'5"S 152°50'13"E, Malaise over creek, 13–19.vi.1998, N. Power (1♂, DEBU), Mt Glorious, 27°19'54"S 152°45'29"E, Malaise, 24–30.xi.1998, T. Hiller (3♀♀, DEBU), 24–30.i.1998 (1♂, DEBU), SE QLD, Brisbane, Griffith Uni., Nathan Campus, 23.x.2002, 27.33S/153.04E, dry&wet sclrophyll forest, ferns, B. Merz (1♂, MHNG), N QLD, Mt. Spurgeon, wet sclera. For., 1250 m, 18–19.iv.1994, B.J. Sinclair, 16°26'S 145°12'E (1♀, CNC), Monga State Forest, 19–24.i.1984, L. Masner (1♀, CNC), Mt. Glorious, x.1978, A. Hiller, Malaise (1♀, ANIC), Mt. Haig, 21km NE by E of Atherton, 18.xi.1981, D.H. Colless, Malaise trap (1♂, ANIC), 15.50S 145.20E, Gap Ck., 5km ESE Mt. Finnigan, 15.v.1981, D.H. Colless, Malaise trap (1♀, ANIC), Great Sandy Nat. Pk., Cooloola Section, 25°56'49"S 153°05'30"E, 1–5.x.1996, D.K. Yeates, G. Lambkin & S. Winterton, Malaise trap (1♂, UQIC), Noosa Natl. Pk., Palm Trail, sweeping, 30.iv.1999, S.A. Marshall (1♂, DEBU). **Tasmania**: Claytons, i.1991, Nielsen & Edwards (1♂ 1♀, ANIC). **Victoria**: Sherbrook Forest near Melbourne Via., 21.i.1966, D.K. McAlpine (1♀, AMS).

Redescription

Male (Figs 1, 2, 5). Body length 2.7–5.2 mm. Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista pubescent. Vibrissa relatively long and curved. Ocellar bristle thin and approximately as long as tubercle. Two dorsocentral bristles with small bristle in front of anterior dorsocentral. Gena relatively high and sometimes with inward bend at mid-height (not as distinct as in *H. laticornis*). Face and buccal cavity velvety and meeting at slightly rounded angle. Head yellow with posterior ⅔ of frons (usually excluding lateral and posterior margins) dark brown (remainder orange) and back of head above foramen dark brown; first flagellomere sometimes with narrow infuscation along anterior margin or around base of arista; USNM specimen with distal ⅔ of first flagellomere dark brown; occiput brown (venter often yellow in southern specimens) and gena yellow with posterior half sometimes brown (more frequently brown in northern specimens); clypeus brown; anterior half of frons pilose and dorsal margin of gena silvery tomentose. Thorax dark brown with proepisternum yellow and posterolateral margin of scutum to anterolateral margin of scutellum sometimes with variably yellow to orange tint (more common northwards). Legs yellow with fore coxa white, fore tarsi dark brown and laterally compressed, fore tibia brownish (lighter to base), and fore femur with long, ill-defined spot on inner apex. Abdomen dark brown. M_{1+2} ratio 3.7–5.3. Wing with basal band confluent with second band through cells br and bm; second and third bands (confluent through first radial cell) separated evenly by thin clear strip. Halter white with base and side of stalk infuscated.

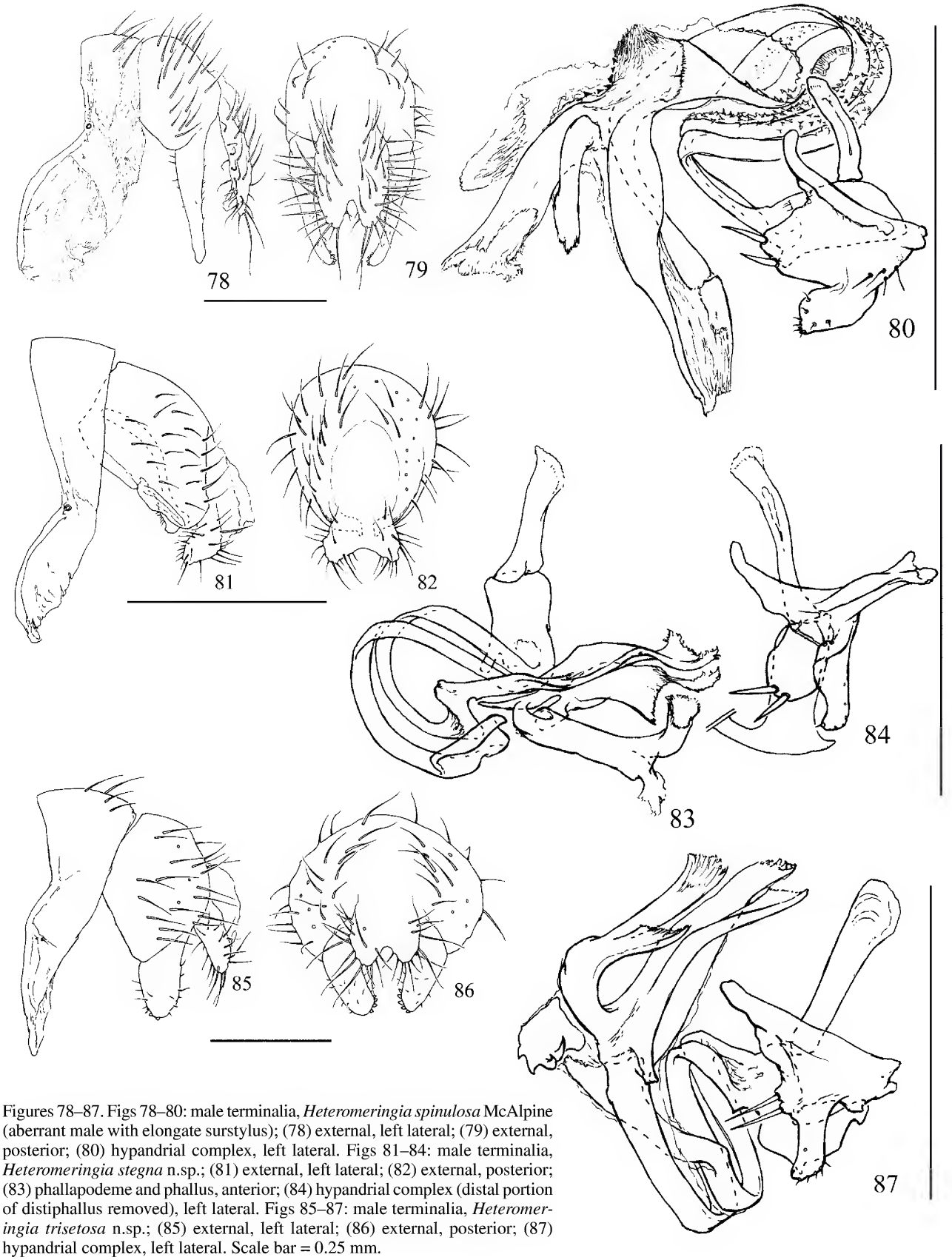
Female. As described for male except as follows: pale spots on scutum faded or absent; anterior and inner-distal margins of first flagellomere infuscated, sometimes with distal ⅔ of inner face dark; frons shiny or with small pilose anteromedial patch; only anterior and lateral margins of frons with orange tint; face and gena with piceous tint; fore tibia and tarsi evenly brown; terminalia yellow.

Male terminalia (Figs 73–77). Length of epandrium slightly more than half width and height. Surstylus ⅔ height of epandrium, very thin and pointed, with few inner-apical tubercle-like bristles and outer face bare. Cerci approximately as high as surstylus, heart-shaped and heavily setose. Hypandrium+pregonite bilobed (anterior lobe with two stout bristles and posterior lobe setulose at apex and base). Phallapodeme shorter than hypandrium. Distiphallus with membrane on basal half strongly spinulose; with small serrated process medially (vestigial, shallow, slightly longer than wide, or very long and blade-like); wide and heavily elaborated apically with serrated subapical ridge.

Female terminalia (Figs 104, 105). Ventral receptacle rounded apically and flagellum very long, thin and coiled (coils tighter to apex). Spermatheca barrel-shaped (widest subapically) and long with several basal wrinkles.

Comments. Based on external and internal examination of male and female specimens of *Heteromeringia spinulosa* and *H. pulla* from across both of their ranges, it now appears that these two taxa belong to the same species. Their colouration is nearly identical, as are the female genitalia, surstylus and most of the hypandrial complex. The absence of a serrated blade-like process on the phallus and its associated bell-shaped apical lobe (Fig. 77) was previously considered diagnostic of *H. pulla* (although D.K. McAlpine (1960) noted some polymorphism), but these are actually present in a number of males, although the blade is rarely much longer than wide if present and the lobe is frequently underdeveloped (Fig. 75). The other character previously considered diagnostic of either species was whether or not the venter of the gena was entirely (*H. spinulosa*) or only partially (*H. pulla*) yellow. While the presence of either character is generally indicative of whether or not the phallic blade is present, it is sometimes not, and specimens collected in and south of the Australian Capital Territory almost always have an entirely yellow gena (the occiput is also predominantly yellow) regardless of whether the blade is developed or not. The presence of a strong yellow patch extending from the side of the scutellum to the posterolateral corner of the notum is slightly more correlated with the presence of a well developed phallic blade, but the intensity of this patch often varies and is sometimes associated with the "opposite" genitalic state, particularly to the north. Since all of the specimens examined appear to belong to a single (albeit unusually polymorphic) species, *H. pulla* is here treated as a junior synonym of *H. spinulosa* under the first reviser principle (ICZN Article 24.2.1).

In addition to the material listed above, there are several specimens that range from the Australian Capital Territory to Queensland that vary as follows: first flagellomere entirely white; ventral margin of gena and occiput entirely yellow; notum with faint yellowish posterolateral tint; wing pattern relatively indistinct; surstylus much longer than epandrium (Figs 78, 79); phallus branched at midpoint, with branch short, smooth and directed distally (Fig. 80). The elongate surstylus is the most striking feature of these males, but given the amount of genitalic variability already discussed for this species, they will be treated as *H. spinulosa* for the time being. Label data: ACT: 35.22S 148.50E, Blundells Ck., ii.1987, D.H. Colless, Malaise trap (3♂♂, ANIC). NSW: Carrai SF, 30°54'35"S 152°16'26"E, 1090 m, E. Tasker, 11–16.i.1998, sticky trap on *E. obliqua*, CC-FK-018-5 (1♂, AMS). QLD: 18.55S 146.10E, S2 Mt. Spec, 880 m, 5.vi–3.vii.1995, M. Cermak, Fl trap, JCU (East) (1♂, ANIC).



Figures 78–87. Figs 78–80: male terminalia, *Heteromeringia spinulosa* McAlpine (aberrant male with elongate surstylus); (78) external, left lateral; (79) external, posterior; (80) hypandrial complex, left lateral. Figs 81–84: male terminalia, *Heteromeringia stegna* n.sp.; (81) external, left lateral; (82) external, posterior; (83) phallapodeme and phallus, anterior; (84) hypandrial complex (distal portion of distiphallus removed), left lateral. Figs 85–87: male terminalia, *Heteromeringia trisetosa* n.sp.; (85) external, left lateral; (86) external, posterior; (87) hypandrial complex, left lateral. Scale bar = 0.25 mm.

Heteromeringia stegna n.sp.

Figs 81–84

Type material. HOLOTYPE: **Northern Territory**: Litchfield Natl. Pk., 20.i.1998, A. Zwick (1♂, AMS). PARATYPE: **Queensland**: Bamaga-Capt Billy Ck Rd jnct 16km NE Heathlands H.S., 11°41'S 142°42'E, 16.iii.1992, G. Daniels & M.A. Schneider (1♂, UQIC).

Description

Male. Body length 3.1 mm. Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista closely pubescent. Vibrissa relatively long and curved. Ocellar bristle minute. Two dorsocentral bristles with small bristle in front of anterior dorsocentral. Gena shallow and not strongly angled or bent. Face and buccal cavity pilose and meeting at an angle. Frons black and shiny with posterior margin yellowish, and lateral margin yellow and pilose (or pilose anteromedially); back of head, occiput and posterior ⅔ of gena dark brown; clypeus and mentum brown; anterior margin of first flagellomere and distal half of inner face brown; basal ⅔ of palpus brown (holotype) or entirely dark brown excluding apex; remainder of head yellow (holotype) or orange-brown; dorsal margin of gena pilose. Thorax dark brown. Legs yellow with fore tarsi and tibia dark brown; fore femur dark brown on distal ⅓ (holotype) or with inner-distal spot. Fore tarsi very slightly compressed laterally. Abdomen brown. M_{1+2} ratio 5.3. Wing with small anterodistal infuscation (holotype), or dusky with base and posterior margin clear. Knob of halter brown, and base and side of stalk infuscated.

Female. Unknown.

Male terminalia (Figs 81–84). Epandrium elongate oval with margins nearly meeting distally. Surstylus subtriangular, small, setulose on inner face and with base fused to anterior margin of epandrium. Cerci arched over surstyli, setose, widest at apex, and shallowly but broadly emarginate. Hypandrium+pregonite bilobed with broad anterior lobe with two stout bristles, and linear posterior lobe with several posterodistal setulae. Phallapodeme as long a hypandrium. Distiphallus with strong medial curve where one rib ends and the other rib extending into a long process accompanied by irregular U-shaped sclerite.

Etymology. The specific name is Latin for "constricted", in reference to the apical narrowing of the epandrium.

Comments. While relatively non-descript externally, the male genitalia of this species are heavily modified: the epandrium is constricted apically, the cerci are very broad apically, and the nearly vestigial surstylus is positioned anteriorly (not apically) and partially fused to the epandrium.

Heteromeringia trisetosa n.sp.

Figs 9, 85–87, 106

Type material. HOLOTYPE: **Tasmania**: 41.50S 146.03E, Pelion Hut 3km S Mt. Oakleigh, 850 m, 8.i–12.ii.1991, A. Calder & W. Dressler, Malaise #5, closed forest (1♂, ANIC). PARATYPES: **New South Wales**: Penrose SF, nr. Marulan, 20.x.1989, D.K. McAlpine (1♂, AMS), Mooney Mooney Creek near Gosford, 26.i.1984, B. Duckworth, B. Day and D.K. McAlpine (1♂, AMS), E NSW, Royal National Park, E Waterfall rail. Stat., 12.x.2002, 10, 34.09S/151.01E, B. Merz / 10, diff. types forest (1♀, MHNG). **Queensland**: SE QLD, Brisbane, Griffith Uni., Nathan Campus, 23.x.2002, 18, 27.33S/153.04E, dry & wet sclerophyll forest, ferns, B. Merz / 18 (1♂, MHNG).**Western Australia**: Shannon townsite camp, shrimp carrion trap, 25.xi.2003, S.A. Marshall (1♂, DEBU). **Tasmania**: Pelion Hut, 30.xi.1990–9.i.1991, Nielsen & Edwards, Malaise #5 (1♂ 1♀, ANIC), 41.50S 146.03E, Pelion Hut 3km S Mt. Oakleigh, 850 m, 8.i–12.ii.1991, A. Calder & W. Dressler, Malaise #5, closed forest (1♀, USNM).

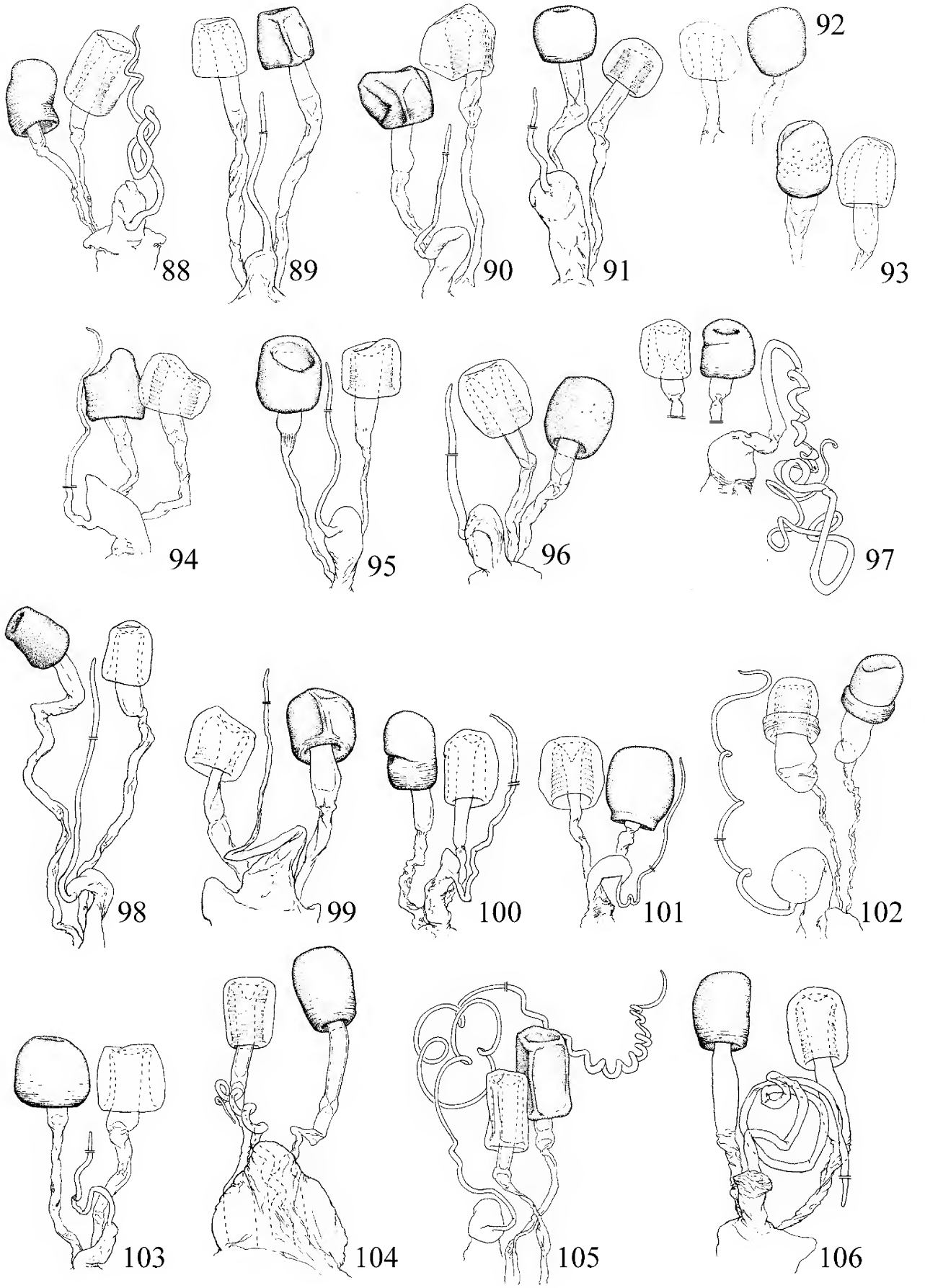
Description

Male. Body length 3.3–3.5 mm. Anepisternal disc present. First flagellomere orbicular. Bristles black. Arista closely pubescent. Vibrissa relatively long and curved. Ocellar bristle long and relatively thin. Three dorsocentral bristles (decreasing in height anteriorly) with one small bristle in front of anterior dorsocentral. Gena high and sharply incurved medially at mid-height. Face and buccal cavity evenly curving and velvety. Frons dark brown with anterior margin orange, and lateral and posterior margins yellowish; antenna (excluding arista) yellow with first flagellomere dark brown excluding base; back of head dark brown (reddish above); occiput and clypeus dark brown; face yellow or with orange tint; remainder of head yellow; frons pilose to level of ocellar tubercle; dorsal half of gena silvery tomentose. Thorax dark brown. Fore legs dark brown with base of tibia yellow and fore coxa dirty yellow/brown and silvery tomentose with base brown; mid and hind legs dark brown with distal half of mid femur brownish to yellow, apex of coxae to base of femora yellow, mid tibia and tarsi light brown and hind tibia yellow with two dark bands. Abdomen dark brown. M_{1+2} ratio approximately 6.0. Wing lightly clouded around cross veins and along anterodistal and distal margins. Halter white with stalk brownish (darker to base).

Female. As described for male except as follows: first flagellomere infuscated on outer-dorsal margin, anterior margin and distal ⅔ of inner face; frons shiny laterally; tergites 2–5 slightly lighter.

Male terminalia (Figs 85–87). Epandrium small and relatively wide. Cerci less than half height of epandrium and apically emarginate. Surstylus higher than long, rounded, almost bare on outer face and with inner-distal tubercle-like bristles. Hypandrium+pregonite triangular with two stout medial bristles and several setulae on elongate posteroventral

Figures 88–106 [facing page]. Female internal genitalia; (88) *Heteromeringia asteia* n.sp.; (89) *H. australiae* Malloch; (90) *H. australiae* (aberrant NSW female); (91) *H. australiae* (abberant QLD female); (92) *H. bisetosa* n.sp.; (93) *H. hardyi* McAlpine; (94) *H. helina* n.sp.; (95) *H. hypoleuca* McAlpine; (96) *H. imitans* Malloch; (97) *H. imitans* (type 2 female); (98) *H. imitans* (type 3 female, CNC); (99) *H. laticornis* McAlpine; (100) *H. limacens* n.sp.; (101) *H. macropa* n.sp.; (102) *H. patula* n.sp.; (103) *H. ptenopa* n.sp.; (104) *H. spinulosa* McAlpine (dark gena, QLD); (105) *H. spinulosa* (pale gena, QLD); (106) *H. trisetosa* n.sp.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process. One rib of distiphallus ending at ⅔ length and with floating sclerite near apex; second rib divided into two bifid processes with fringed ends.

Female terminalia (Fig. 106). Ventral receptacle narrowed at base and flagellum long, thin and straight. Spermatheca longer than wide, widest medially and wrinkled at base.

Etymology. The specific name refers to the three dorsocentral bristles characteristic of this species.

Comments. *Heteromeringia trisetosa* is unique among the Australian *Heteromeringia* in having three pairs of well developed dorsocentrals—all other species have two pairs, sometimes with a well developed setula in front of the anterior dorsocentral.

ACKNOWLEDGMENTS. I would like to thank the following people and institutions for lending the material used in this study: D. Britton, D.K. McAlpine and M. Moulds (AMS); D.K. Yeates (ANIC), J. Cumming (CNC), F. Menzel (DEI), B. Merz (MHNG), C. Lambkin (QMBA), A. Freidberg (TAU) and Greg Daniels (UQIC). D. Bickel, R. Russell and D. Yeates are thanked for their help in locating type material. Lastly, W.N. Mathis and D.K. McAlpine are thanked for their review of this manuscript and D.K. McAlpine is thanked for his correspondence regarding the Australian Clusiidae. This study was supported by a Schlinger Postdoctoral Fellowship grant.

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